Undergraduate and Graduate Announcements 1981-83

PURDUE UNIVERSITY

PC

CALUMET

CALENDAR

FIRST SEMESTER	Time	1981-82* School Yr. Day	Date	1982-83* School Yr. Day	Date
Faculty Convocation		Mon	Aug. 24	Mon	Aug. 23
Regular classes begin	8:00 a.m.	Mon	Aug. 31	Mon	Aug. 30
Labor Day recess		Mon	Sept. 7	Mon	Sept. 6
Thursday classes meet		Tue	Nov. 24	Tue	Nov. 23
Friday classes meet		Wed	Nov. 25	Wed	Nov. 24
Thanksgiving recess begins	11:00 p.m.	Wed	Nov. 25	Wed	Nov. 24
Classes resume	8:00 a.m.	Mon	Nov. 30	Mon	Nov. 29
Regular classes end	11:00 p.m.	Wed	Dec. 16	Wed	Dec. 15
Final Exams begin	8:00 a.m.	Thu	Dec. 17	Thu	Dec. 16
Final Exams end	11:00 p.m.	Wed	Dec. 23	Wed	Dec. 22
First Semester ends		Sun	Jan. 10	Sun	Jan. 9
SECOND SEMESTER					
Regular classes begin	8:00 a.m.	Mon	Jan. 18	Mon	Jan. 17
Spring recess begins	1:00 p.m.	Sat	Mar. 20	Sat	Mar. 19
Classes resume	8:00 a.m.	Mon	Mar. 29	Mon	Mar. 28
Regular classes end	1:00 p.m.	Sat	May 8	Sat	May 7
Final Exams begin	8:00 a.m.	Mon	May 10	Mon	May 9
Final Exams end	1:00 p.m.	Sat	May 15	Sat	May 14
Commencement		Sun	May 23	Sun	May 22
Second Semester ends		Sun	May 23	Sun	May 22
SUMMER SESSION					
Summer Term begins		Mon	May 24	Mon	May 23
Summer Session begins		Mon	June 7	Mon	June 6
Summer Classes begin	8:00 a.m.	Mon	June 14	Mon	June 13
Independence Day recess		Mon	July 5	Mon	July 4
Summer classes end	11:00 p.m.	Wed	Aug. 4	Wed	Aug. 3
Final Exams begin	8:00 a.m.	Thu	Aug. 5	Thu	Aug. 4
Final Exams end	11:00 p.m.	Fri	Aug. 6	Fri	Aug. 5
Summer Term ends		Sun	Aug. 22	Sun	Aug. 21

*Weekend College schedule to be announced separately.

INFORMATION SUBJECT TO CHANGE: The information contained in this bulletin is subject to change as a result of action by the Federal and State governments, the Trustees of Purdue University, and the administration of Purdue University. Questions concerning contents of this bulletin should be directed to the appropriate University department or official.

Purdue University Calumet is fully accredited by the North Central Association of Colleges and Secondary Schools.

Announcements for the Years 1981-83

PURDUE UNIVERSITY PC CALUMET

Hammond, Indiana 46323
(219) 844-0520

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Purdue University is an equal access/equal opportunity university.

PURDUE UNIVERSITY

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West Lafayette, Indiana

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PURDUE CALUMET

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Samuel D. Paravonian, Ph.D., ... Assistant Dean of the Graduate School
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and Technology

Alfred D. Sander, Ph.D., ... Dean, School of Humanities, Education
and Social Sciences

William R. Wright, Ph.D., ...Director of Continuing Education

GENERAL INFORMATION

The year 1981 marks 112 years of growth and progress for Purdue University. From an institution of six instructors and 39 students, Purdue, Indiana's land-grant college, has grown to a major university with a faculty of more than 2,100 and a student body of more than 35,000 on four campuses.

Purdue has established, largely since World War II, a series of regional campuses for the purpose of offering educational opportunities in the major population areas of Indiana. The Calumet Campus, the largest of the regional campuses, primarily serves the communities located in the northwestern part of the state. This area — the industrial heartland of the Midwest — is adjacent to metropolitan Chicago and is situated in the southeastern section of Hammond, just off the Borman Expressway and Indianapolis Boulevard.

HISTORY

Purdue University has been a part of the Calumet region's educational community for many years, growing with the educational needs of the area and the nation. Purdue's Calumet operation began in what was almost a casual fashion, as extension classes, short term projects, and other special events, taking advantage of already existing physical facilities in the area.

The first major change came in 1943, when the pressures of production for World War II rapidly increased the needs of the area's industries for skilled craftsmen and technicians. A series of technological programs were instituted under the War Manpower Training Act, in which Purdue, as a land-grant college, participated.

In 1946, first steps toward permanent operations of the University in the Calumet area were undertaken with the appointment of resident faculty and the offering of regular undergraduate courses. By 1948, University administrators and other community leaders were certain that the rapid growth of higher education was to be a feature of the nation's life, and so purchased, in part with money contributed by Calumet area business and individuals, land totaling about 167 acres, bounded by the Calumet Expressway, 169th Street, Woodmar Avenue, and a line running variously from Wicker Avenue to the New York Central tracks. In 1951 Purdue moved into the first building on its permanent site. In 1954, the Industrial Research Institute building was completed. The funds for these buildings came, for the most part, from the University's Ross-Ade Foundation. A small parcel of land was transferred to the state of Indiana for the building of the National Guard Armory, which was also to provide physical training facilities for Purdue students. A $2.5 million addition to the original campus building was opened for use in 1963. Since that time building has been continuous following a master plan for total campus development of the original 1948 purchase to meet the growing educational needs of the Calumet region. The present air-conditioned physical facilities — including an ever-growing library, modern laboratories and lecture halls, spacious classrooms, a new physical education/recreation facility, well-appointed lounges and study halls, and closed-circuit television facilities — form but part of a rapidly expanding campus. The granting of academic autonomy to Purdue Calumet on July 1, 1974 provides the opportunity to present unique programs of study that will better service the needs and interests of the citizens of the Calumet region. Indeed, growth in student body and in breadth of offerings will add still further chapters in the University's history of service to the community.

PURPOSE AND FUNCTION

Purdue University Calumet espouses the spirit of the land-grant university tradition and is especially dedicated to the service of the people of northwest Indiana within the charter given to Purdue University. At this time its primary mission is threefold: to provide its students with a liberal education that will prepare them for life or the professions; to provide career-oriented studies that lead to certificates, associate degrees, baccalaureate degrees, and master's degrees; and to provide programs that meet the professional, cultural, and general educational needs of the community.

To fulfill this mission the Board of Trustees has authorized the Calumet Campus to institute, when needed, any of the undergraduate programs traditionally a part of Purdue's programs. Under this grant of authority the Calumet Campus held its first commencement in June 1967.

Within its goal of providing a liberal education and preparing students for the professions, the Calumet Campus offers baccalaureate programs in a wide range of disciplines such as communication, English, history, mathematics, chemistry, German, political science, and psychology. Baccalaureate programs which are more career related include elementary and secondary teaching, engineering, nursing, construction technology, manufacturing technology, supervision technology, and electrical technology. To provide for the professional, cultural, and general education needs of the community, the campus regularly offers various types of continuing education, dramatic performances, and concerts, as well as graduate programs offered in conjunction with the West Lafayette Campus.

In accordance with a long-standing policy of the Board of Trustees, all educational services and programs of the University are available and open to all academically qualified individuals without any discrimination whatsoever with respect to creed, national origin, race, or sex.

ORGANIZATION

Purdue Calumet functions as an integral part of Purdue University. Faculty members, numbering nearly 200 full-time and ranking from instructor to professor, are represented in policy formulation by an elected body called the Council of Faculty Delegates. They normally hold appointments in the schools of Engineering Management and Technology, Humanities, Education and Social Sciences or Science and Nursing.

A single Board of Trustees governs the entire Purdue University system through the President of the University. The senior administrative officer at Purdue University Calumet is the Chancellor who reports directly to the President.

Diplomas are awarded by "Purdue University, at Hammond, Indiana."

LIBRARY AND AUDIO-VISUAL SERVICES

The Library and Audio-Visual Services are located on the second floor of the Student-Faculty Library Center. The Library collection now contains over 133,500 physical volumes, approximately 1,100 periodical subscriptions, and more than 255,000 microform units. Open 84 hours a week with Saturday and Sunday hours, the library provides seating for 600 students with individual carrel seating for 300. Reference, copy, and interlibrary loan services between the Purdue campuses are available to all students and faculty members. In addition to an audio-tutorial laboratory, the Audio-Visual Service acts as the film booking agent for faculty and students. Audio-visual equipment may be reserved for class, club, or campus organization use.

COURSE OFFERINGS AND DEGREES AUTHORIZED AT PUC

Major	2 Years	Bachelor's Degree	Graduate Level
ENGINEERING, MANAGEMENT AND TECHNOLOGY			
Architectural Technology	AAS		
Civil Engineering Technology	AAS		
Computer Technology	AAS	BS	
Construction Technology		BS	
Economics		BS	X
Economics Education			MA
Electrical Technology		BS	
Electrical Engineering Technology	AAS		
Engineering		BSE	MSE
Industrial Engineering Technology	AAS	BS	
Management		BS	MS
Mechanical Drafting Design Technology	AAS		
Mechanical Engineering Technology	AAS		
Mechanical Technology		BS	
Metallurgical Technology	AAS		
Supervision	AAS	BS	
Technical Teaching		BSIE	X
Vocational Industrial Teaching		BSIE	X
All Others	X		
HUMANITIES, EDUCATION AND SOCIAL SCIENCES			
American History		BA	MA
American Literature		BA	MA
Associate of Arts	AA		
Child Day Care	AA		
Communication		BA	X
Consumer and Family Sciences	X		X
Educational Administration			MS
Educational Media		BA	MS
Elementary Education		BA	MS
English Literature		BA	MA

COURSE OFFERINGS AND DEGREES AUTHORIZED AT PUC

Major	2 Years	Bachelor's Degree	Graduate Level
English Teaching		BA	MA
European History		BA	MA
Food Service and Lodging Supervision	AAS		
French		BA	X
French Teaching		BA	X
German		BA	X
German Teaching		BA	X
Guidance and Counseling			MS
Health and Safety		BPE	X
Physical Education		BPE	X
Political Science		BA	X
Psychological Sciences		BA	X
Secondary Education			MS
Social Studies Teaching		BA	X
Sociology		BA	X
Spanish		BA	X
Spanish Teaching		BA	X
Speech and Theater Teaching		BA	X
All Others	X		
SCIENCE AND NURSING			
Agriculture	X		X
Applied Mathematics		BS	MS
Biology		BS	MS
Biology Teaching		BS	MS
Chemical Technology	AAS		
Chemistry		BS, BS in Chemistry	X
Chemistry Teaching		BS	X
Computer Science		BS	
Forestry	X		
Mathematics		BS	MS
Mathematics Teaching		BS	MS & MAT
Medical Technology		BS	
Nursing	AAS	BS	
Physics		BS	X
Physics Teaching		BS	X
Predentistry		BS	
Premedicine		BS	
Prepharmacy	1 Year		
Preveterinary Science	X		
Science Teaching		BS	MS
All Others	X		

X indicates individual course offerings without a complete degree program.

ADMISSIONS

GENERAL UNDERGRADUATE ADMISSIONS REQUIREMENTS

All persons wanting to take advantage of the opportunity for higher education at Purdue University Calumet must file an application for admission. Requests for information and appropriate application forms should be addressed to:

Office of Admissions
Purdue University Calumet
2233 — 171st Street
Hammond, Indiana 46323

Degree seeking students are enrolled in one of four schools: The School of Engineering, Management and Technology; the School of General Studies; the School of Humanities, Education and Social Sciences; and the School of Science and Nursing. The admission requirements vary among the different schools and departments. (See chart on page 11.)

An applicant's eligibility for consideration to the school or curriculum of his choice will depend upon many factors, among which are:

1. Subject matter requirements for the school or curriculum to which he is applying;
2. High school class standing;
3. College Entrance Examination Board Scholastic Aptitude Test results;
4. High school comments and recommendations;
5. Previous college work, if any; and
6. Other personal information.

Explanation of Eligibility Facts.

1. Subject Matter Requirements — The table on page 11 shows the minimal requirements for each school or curriculum within the University. High school students who desire to study chemistry, engineering, mathematics, or physics should establish credit in the following high school subjects in addition to the minimum requirements in order to graduate in eight semesters: A fourth year of advanced mathematics; and a full year of both chemistry and physics.
2. High School Class Standing — Applicants seeking admission to the School of Humanities, Education and Social Sciences, and the curricula of administrative sciences, biology, chemistry, engineering, mathematics, nursing and physics are expected to be upper-half quality students in their graduation class. Applicants seeking admission to the curricula of technology, supervision, agriculture, and forestry are expected to be upper two-thirds quality students in their graduating class. The School of General Studies will consider for admission individuals with a high school diploma or equivalent.

   Quality rank is determined by considering a combination of class rank, grade point average, grade average in subjects related to degree objectives, trends in achievement through high school, satisfying high school subject matter requirements, strength of college preparatory program, and standardized test results. Graduation from a high school accredited by state department of public instruction with a minimum of 15 units of credit required.

   Applicants unable to meet the selective admission requirements of the School of Engineering, Management and Technology, the School of Humanities, Educa-

tion and Social Science or the School of Science and Nursing are offered admission to the School of General Studies providing they possess a high school diploma or equivalent.

3. Test Required — All beginning Indiana applicants seeking admission to the University must submit the College Board Scholastic Aptitude Test results. Non-resident applicants may substitute American College Test scores for the required Scholastic Aptitude Test scores.

On the basis of the factors considered, action on the individual's application may be one of the following:

a. Granted Regular Admission — This means that the applicant has met all entrance standards and requirements for admission to the school or curriculum to which applicant is admitted.
b. Granted Admission with Undesignated Status — This applies to the applicant whose academic background and preparation does not meet the entrance standards and/or requirements, but who the University feels has a reasonable chance for success in a specific Purdue program.
c. Admitted on Probation — This applies to transfer applicants whose previous college grade point index is less than C average.
d. Admissions denied or postponed until an adequate academic background or preparation can be demonstrated.

Any admission to the University is provisional pending the receipt of all required student information.

ADMISSION REQUIREMENTS

SCHOOL	PROGRAM	QUALITY RANK*	MATH	LABORATORY SCIENCE	ENGLISH	FOREIGN LANGUAGE	HISTORY or SOC. STUDIES
Engineering, Management & Technology[1]	Engineering Management	Upper ½	3 Sem. Algebra 2 Sem. Geometry 1 Sem. Trig.	2 Sem.	6 Sem.	None	2 Sem.
	All Technologies Supervision Industrial Education Computer Programming	Upper ⅔	2 Sem. Algebra 2 Sem. Geometry	2 Sem.	6 Sem.	None	2 Sem.
General Studies	All	High School Diploma, GED, or equivalent	No Specific Subjects Required				
Humanities, Education & Social Sciences[1]	Associate of Arts	Upper ½	2 Sem. Algebra 2 Sem. Geometry	2 Sem.	8 Sem.	None	2 Sem.
	Day Care — Child	Upper ⅔	2 Sem.	2 Sem.	6 Sem.	None	2 Sem.
	Food Service & Lodging Consumer & Family Science	Upper ½	2 Sem. Algebra[2] 2 Sem. Geometry	2 Sem.	6 Sem.	None	2 Sem.
	Physical Education	Upper ⅔	2 Sem. Algebra 2 Sem. Geometry	2 Sem.	6 Sem.	None	2 Sem.
	All Others	Upper ½	2 Sem. Algebra 2 Sem. Geometry	2 Sem.	8 Sem.	4 Sem.	2 Sem.
Science & Nursing[1]	Agric Engineering Forestry	Upper ⅔	2 Sem. Algebra 2 Sem. Geometry 1 Sem. Trig.	2 Sem.	6 Sem.	None	2 Sem.
	Other Agriculture Pre-Vet Science Chemical Technology	Upper ⅔	2 Sem. Algebra 2 Sem. Geometry	2 Sem.	6 Sem.	None	2 Sem.
	Biology Chemistry Mathematics Physics	Upper ½	3 Sem. Algebra 2 Sem. Geometry 1 Sem. Trig.	2 Sem.	6 Sem.	None	2 Sem.
	AAS Nursing	Upper ½	2 Sem. Algebra[3] 2 Sem. Geometry	4 Sem.[4]	6 Sem.	None	2 Sem.
	BS Nursing (PNT Option only)		Successful completion of Associate Degree or diploma program in Nursing with R.N. Licensure.				

[1]Upper-half quality EMT, HESS, and S & N applicants may be admitted with 4 semester subject matter deficiency.

[2]May be 2 semesters of algebra and 2 semesters of geometry, or 4 semesters of algebra, or other combination approved by the Office of Admissions.

[3]May substitute additional 2 semesters of lab science for 2 semesters of geometry.

[4]Must include 2 semesters of chemistry.

*Quality is determined by considering a combination of class rank, grade point average, grade average in subjects related to degree objectives, trends in achievement throughout high school, satisfying high school matter requirements, strength of college preparatory program, and standardized test results. Graduation from an accredited high school with a minimum of 15 units of credit is required.

TRANSFER STUDENTS

An applicant transferring from another college or non-Purdue campus must fulfill the following requirements in order to be considered for admission:

1. Submit an application for admission including high school transcripts of credit.
2. Forward an official transcript of work done at institutions previously attended. Transfer applicants who do not have a C average or who fail to meet the subject-matter requirements will be eligible to enroll in the School of General Studies provided they possess a high school diploma or equivalent.

Credit earned at other accredited institutions will be evaluated in terms of how it fulfills the graduation requirements at Purdue Calumet.

Transfer credit from junior colleges not regionally accredited may be considered on the same basis as that from regionally accredited junior colleges for students who score an average of 500 or better on the five sections of the College Level Examination Program (CLEP) general examinations administered by the College Board.

Students transferring into ABET (Accreditation Board for Engineering and Technology) accredited programs at Purdue Calumet from institutions or programs not accredited by ABET will be required to pass department placement examinations to establish credit in the Purdue ABET accredited courses.

ADMISSION TO A B.S. TECHNOLOGY (ADD-ON) PROGRAM:

A transfer applicant from a non-Purdue Campus wishing to enter one of Purdue Calumet's B.S. programs in technology must hold an appropriate associate degree equivalent to Purdue's associate degree to be eligible to enter at the junior level (semester five classification).

Applicants not possessing an equivalent Purdue associate degree may be required to take additional courses in their junior and senior years.

NON-DEGREE ENROLLMENT

Persons desiring to enroll in a one-year certificate program should submit the non-degree application.

Transient students desiring to enroll on a part-time, one-semester basis, may file a non-degree application and be approved to enroll without submitting required test scores and transcripts of credit. Transfer applicants for admission who have been academically dismissed at another college/university within the last six months may not be approved to enroll as a non-degree student.

High school seniors interested in earning college credits while still enrolled in high school, should first contact their guidance counselor for the appropriate non-degree application. To be eligible the following requirements must be met:

1. Ranks in the top fifty per cent of the class.
2. Needs scholastic enrichment not available at the high school.
3. Will meet high school graduation requirements without use of Purdue courses.
4. Has completed the equivalency of six semesters of high school.

RE-ENTERING STUDENTS

A person who formerly attended a Purdue campus but has not been in attendance for one semester or more and has not been dropped from the University should submit a re-entry application at least three weeks prior to registration for the semester they wish to re-enter. Each applicant's re-entry status is determined by the department head. If approved for re-entry, the applicant will be sent an Offer of Admission.

STUDENTS TRANSFERRING FROM ANY PURDUE CAMPUS

Students currently attending any Purdue Campus and desiring to transfer to Purdue Calumet for the following semester should file a regional campus transfer application at least three weeks prior to registration. The application can be filed at the campus currently attending. If approved for transfer, the student will be sent an Offer of Admission.

ADVANCED CREDIT

The University is anxious to give recognition in the form of advanced standing and credit to students who have successfully completed college-level work in their high schools. There are three basic ways in which credit may be established:

1. College Board Advanced Placement Tests — Credit may be established on the basis of test results taken at the completion of the advance placement course in high school. Students should have the results forwarded to the Office of Admissions at the Calumet Campus.
2. Purdue Advanced Credit Examinations — Students may be invited to take special examinations in various subject matter areas as determined by evidence of competency on high school record, SAT's and college board achievement tests in English, mathematics, and chemistry, and semesters of high school subjects.
3. College Level Examination Program — CLEP is designed for the purpose of evaluating nontraditional college-level education such as independent study, correspondence work, and credit earned from nonaccredited institutions. Purdue credit may be established by taking certain subject matter examinations. Contact the Office of Admissions for a list of the approved examinations and the score required to establish credit.

Advanced standing and credit should not be confused with placement. Placement involves having students start at the correct level of a course within the freshman sequence. High School record, CEEB, SAT, and achievement test results are employed in making these placements. Placement involves no advanced credit.

FINANCIAL AIDS

PURPOSE AND PHILOSOPHY

The purpose of the financial aid programs at Purdue Calumet is to provide financial assistance for needy students to meet their educational expenses. In awarding aid, the Office of Financial Aids recognizes that it is the primary responsibility of the parents and/or students to contribute toward financing a college education to the extent that their means permit. The difference between that family contribution and the education-

al costs of attending Purdue University Calumet is the student's demonstrated financial need.

HOW TO APPLY FOR FINANCIAL AID

A student interested in applying for financial aid from Purdue Calumet needs to submit the FAF to be considered for scholarship, grant, loan or work-study assistance. In addition, a Purdue Calumet financial Aid Application must be submitted.

To insure full consideration for all forms of aid, complete each of the following steps:

Step 1: Apply for admission to Purdue Calumet. You must be admitted to the University as a degree seeking student before you will be considered for aid.

Step 2: All applicants, new and continuing, must file an FAF with the College Scholarship Service designating Purdue Calumet, #1638, as the recipient of the analysis.

Step 3: Apply for a Basic Educational Opportunity Grant (BEOG). By completing the appropriate section on the FAF, you will automatically be considered for this federal program. Within six weeks you will receive a Student Eligibility Report (SER) indicating your eligibility for this program. Upon receipt of the SER, submit all copies to the Office of Financial Aid.

Step 4: Apply for a State Scholarship and/or Grant (Indiana residents only). Contact your high school counselor for a scholarship application. Enter SSACI, #0764, on the FAF to apply for both the scholarship and grant program.

Once the results of all required applications are in the Purdue Calumet Office of Financial Aid, you will be evaluated for campus-based federal aid. If eligible, the University attempts to put together a "package" of aid to approach or meet the needed amount. Three types of financial aid money: 1) scholarships and grants (money that does not have to be repaid); 2) loans (money that must be repaid); and 3) work-study (money that is earned by the student) are found in most packages.

Once the award has been packaged, the student is sent an award letter that must be signed and returned to the financial aid office before the award can be processed. The student must indicate acceptance or rejection of the types of funds awarded in the appropriate columns on the award letter, sign and date the award letter in the space at the bottom.

Following the student's registration for classes, a bill is generated and mailed to the student. It is then the student's responsibility to return the bill to the Bursar's Office and have the accepted aid applied to the fees. If the financial aid is greater than the charge for tuition and fees, a credit will be disbursed to the student via a check Wednesday of the second week of classes or a Wednesday thereafter.

THE COST OF ATTENDING PURDUE CALUMET

Your educational costs depend upon 1) how many classes you take each semester 2) how far you will commute from home each day, and 3) whether or not you live with your parents. Classes at Purdue Calumet currently cost $28.25 per credit hour for an Indiana resident and $63.50 per credit hour for the Out-of-State resident. In addition there is a $26 Athletic and Activities fee per semester. There may also be Laboratory fees assessed for some classes ($9 per lab).

The total costs of books will also depend upon the number of classes taken. You should expect to spend an average of $30 for books for each class. Other educational expenses include transportation, personal expenses, clothing, and room and board. Although these maintenance costs will differ among students, financial aid budgets are

based on average costs according to student classification ie. dependent, independent, independent married, etc.

Financial aid budgets are updated on a yearly basis in order to adjust to the changes in tuition and fees and living expenses.

PROPOSED FINANCIAL AID BUDGETS — ACADEMIC YEAR

	Indiana Resident		Out-of-State	
	Full-time (16 Cr. hrs)	Part-time (8 cr. hrs)	Full-time (16 Cr. Hrs)	Part-time (8 Cr. Hrs.)
DEPENDENT				
Tuition/Fees	1120	420	2380	1140
Books/Supplies	250	125	250	125
Maintenance*	2250	2250	2250	2250
Total**	3620	2795	4880	3515
INDEPENDENT SINGLE				
Tuition/Fees	1120	420	2380	1140
Books/Supplies	250	125	250	125
Maintenance*	3950	3950	3950	3950
Total**	5320	4495	6580	5215
INDEPENDENT MARRIED				
Tuition/Fees	1120	420	2380	1140
Books/Supplies	250	125	250	125
Maintenance*	5320	5320	5320	5320
Total**	6690	5865	7950	6585
CHILD ALLOWANCE per child for either single or married	1150	1150	1150	1150

* The maintenance portion of all budgets includes allowances for transportation, personal expenses, clothing, and room and board.

** Total subject to change due to fluctuating costs.

IMPORTANT DATES

— January 1 — File the Financial Aid Form with College Scholarship Service after this date when you have accurate financial information, but no later than March 1 for primary consideration.

a. Indicate Purdue University Calumet and State Student Assistance Commission of Indiana (Indiana residents only) as recipients of the form.
b. Indicate your FAF is to be used for the Basic Grant Application.

— March 1 — Students filing by this date will be given preference for financial aid from Purdue Calumet. STUDENTS FILING LATER WILL BE CONSIDERED FOR CAMPUS-BASED AID WHEN FILES ARE COMPLETE ASSUMING THEY QUALIFY AND MONIES ARE AVAILABLE.
— June-July — Award notification to all applicants who submitted complete and accurate forms by preferential filing date.
— July 1 — Applications received after this date will be considered only for Basic Grant and/or Guaranteed Student Loan. REMEMBER: The Application process takes from 6-8 weeks. Therefore, an FAF must be filed by no later than May 1, to insure the University receiving a copy by July 1.

SATISFACTORY ACADEMIC PROGRESS

Financial aid recipients are required to make satisfactory academic progress toward a degree objective. Satisfactory academic progress for a full-time undergraduate student is defined as the completion of a minimum of 12 credit hours of D, P, or better per semester of enrollment, (24 credit hours of D, P, or better per 9 month academic year). In addition, students are expected to complete their objective in not more than 10 semesters of enrollment.

Students who fail to meet the satisfactory academic progress requirement, will be placed on Financial Aid Probation. These students will be eligible for financial assistance during the probation period. If the student does not meet the satisfactory academic progress requirement during the probation period, an ineligible status will result for the subsequent year.

Examples:

Student A

Year 1 enrolled in 24 credit hours, completes 21 credit hours, 3 hours deficient
*Student placed on probation for Year 2.
Year 2 enrolled in 24 credit hours, completes 21 credit hours, 3 hours deficient
*Student is no longer eligible for aid until total deficiency is completed or a one year waiting period has passed.

The student could complete the deficient hours during the summer session or the fall semester. During this enrollment period, no financial assistance will be available to the student.

Students who are enrolled on less than a full-time basis and are receiving financial aid are required to make proportional academic progress. A student awarded funds based on a three-quarter time academic standing would be expected to complete 9 credit hours of D, P, or better per semester (18 credit hours of D, P, or better per 9 month academic year). A student awarded funds based on a half-time academic standing would be expected to complete 6 credit hours of D, P, or better per semester (12 credit hours of D, P, or better per 9 month academic year).

BASIC INFORMATION ABOUT AID SOURCES

PROGRAMS	ELIGIBILITY	DESCRIPTION OF PROGRAM	REPAYMENT	HOW TO APPLY
Basic Educational Opportunity Grant BEOG	Undergraduate. Minimum of six credit hour enrollment. Must show need. U.S. citizen or permanent resident.	Amount of award based upon EI (eligibility index) and hours of enrollment.	No repayment obligation.	Complete a BEOG application or give CSS permission to send the information from the FAF to Basic Grant.
Supplemental Educational Opportunity Grant (SEOG)	Undergraduate. Limited availability. Must show need.	Program is to supplement other federal aid programs such as the basic grant if the student continues to show need.	No repayment obligation.	Complete an FAF listing PUC, #1638 as a recipient. Be sure to include proper remittance.
Indiana Educational Grant (IEG)	Undergraduate. A resident of Indiana. Must show need. Fulltime student with 12 credit hours or more.	Can be applied to tuition and fees only.	No repayment obligation.	Complete an FAF listing SSACI, 0764 as a recipient. FAF must be filed no later than March 1. Be sure to include proper remittance.
Nursing Grant	Minimum of six credit hours. Must show need. U.S. citizen or permanent resident. Be accepted into Associate Degree or Baccalaureate Degree nursing program.	Program is to supplement other federal aid programs such as the Basic Grant if the student continues to show need.	No repayment obligation.	Complete an FAF listing PUC, #1638 as a recipient.
Purdue University Calumet Scholarship	Full-time student with 12 credit hours or more. U.S. citizen or permanent resident. B (5.0) grade average or better. Show Financial need.	Covers about two-thirds of student's tuition, and is applicable to fees and tuition only.	No repayment obligation.	Complete an FAF listing PUC, #1638 as a recipient.

LOANS

National Direct Student Loan (NDSL)	U.S. Citizen or permanent resident. Must show need. Enrolled full (12 hours) or part-time (6 hours). Undergraduate or graduate.	Maximum $2500 first two years. $5000 as an undergraduate.	Long-term repayment. 6 month grace period after graduation or withdrawal. 4% interest rate begins at time of repayment.	Complete an FAF listing PUC, #1638 as a recipient. Complete PUC financial aid application.
Nursing Loan	U.S. Citizen or permanent resident. Must show need. Be accepted into Associate Degree or Baccalaureate Degree nursing program.	Maximum $2500 first two years. $5000 as an undergraduate.	Long-term repayment. 9 month grace period after graduation or withdrawal. 3% interest rate begins at time of repayment.	Complete an FAF listing PUC, #1638 as a recipient. Complete PUC financial aid application.
Guaranteed Student Loan (GSL)	U.S. citizen or permanent resident. Attending a qualified institution in Indiana. Enrolled at least half-time (6 hours) or full-time (12 hours.)	Maximum per academic year: $2500 undergraduate. Total aggregate $10,000. $5000 graduate. Total aggregate $15,000 including undergraduate loans.	Long-term repayment. 6 month grace period after graduation or withdrawal. 9% interest rate begins at time of repayment.	Obtain Application from participating bank, savings & loan, credit union etc.
Purdue University Student Loan	Enrolled in 8 credit hours or more per semester. Academic ability and financial need.	Maximum per academic year: $1500. Undergraduate. $2500 per academic year: graduate. Total aggregate $7500 including undergraduate loans.	Period of repayment not to exceed 4 years. Repayment of no less than $50 per month begins in the second month after leaving the university or dropping below half-time enrollment.	Complete an FAF listing PUC, #1638 as a recipient. Complete a PUC financial aid application.

EMPLOYMENT

College Work Study (CWS)	Undergraduate or graduate. Must show need. Enrolled at least half-time (6 hours) or full-time (12 hours or more.)	On-or-off campus employment. Off-campus employment is arranged through the Financial Aid Office with public or private not-for-profit agencies.	Not applicable.	Complete an FAF listing PUC, #1638 as a recipient. Complete a PUC financial aid application.

OTHER

Child of Disabled Veteran (CDV)	U.S. citizen or permanent resident. Be the child of a parent who has (had) a service-connected disability. Verified through the Veterans Administration. Undergraduate and graduate students.	Can be applied to tuition and fees. Covers about two-thirds the total cost of tuition. Can be used for eight semesters.	No repayment obligation.	Obtain and complete application from PUC office of Financial aid.

REGISTRATION

There are three distinct registration periods for fall, spring and summer sessions.

ADVANCE REGISTRATION

Held at announced times during the preceding semester, advance registration enables currently enrolled students to preregister for the forthcoming semester or summer session. New students are also assigned times during which they may preregister. In general, advance registration eliminates the encountering of long lines, and it assures students of preferential scheduling.

OPEN REGISTRATION

Open registration occurs prior to the beginning of classes and is scheduled to correspond with the Academic Advising Schedule. It should be used primarily by those students unable to advance register. In addition, those students who have advance registered may process schedule adjustments (add/drops) during open registration.

LATE REGISTRATION

During the first week of classes late registrations may be accomplished, subject to the availability of classes, approval of the academic advisor and payment of a late fee.

ADDING A COURSE

Students may add courses to their schedules during the first four weeks of the semester by obtaining the academic advisor's signature and the course instructor's signature on an add/drop card. The card must be submitted to the Registrar's Office for processing.

WITHDRAWAL FROM COURSES

A grade will be assigned for each course in which a student is enrolled unless the student officially withdraws from the course. Discontinuance of class attendance does not represent an official withdrawal from a course. To withdraw, a student must submit an add/drop card, signed by the academic advisor, to the Registrar's Office according to the procedures and deadlines stated below.

When a student withdraws from a course prior to the end of the third week (1½ weeks during summer session) the course will not be recorded on the student's record. When a student withdraws after the third week and prior to the end of the ninth week (4½ weeks during summer session) a W shall be recorded. After the ninth week and prior to the end of the twelfth week (sixth week of a summer session), a student may withdraw with the approval of the advisor and the course instructor. The instructor will indicate whether the student is passing or failing by assigning a W or WF (or WN). No withdrawal shall be allowed during the last four weeks of any semester (two weeks during summer session).

A student may be withdrawn from a course by the Scholastic Readmission Committee for excessive absences upon recommendation of the instructor, with approval of the student's advisor and dean of the student's school. A grade of W, WF, or WN may be assigned.

CHANGE OF DEGREE OBJECTIVE

Students wishing to change their major, school or degree objective must contact the Registrar's Office for appropriate instructions and forms.

TRANSFER OF ENROLLMENT TO THE WEST LAFAYETTE CAMPUS

After completing any semester or summer session, a regularly admitted student may transfer enrollment from the Calumet Campus to the West Lafayette Campus or vice versa. To initiate this process, the student must report to the Registrar's Office and complete the necessary forms. Following this procedure, the student will receive an Authorization for Transfer form from the West Lafayette Campus along with instructions for registration. Only students attending on regular status may transfer to the West Lafayette Campus. Transfer applications should be completed early in the semester preceding the actual transfer.

A student regularly enrolled at the West Lafayette Campus for the academic year, but attending summer classes at the Calumet Campus, does not need to file a transfer of enrollment to continue at the West Lafayette Campus for the following academic year.

AUDITING CLASSES

In some cases, students may wish to attend a class on an audit basis. Under such circumstances, no grades or credit will be received.

Registration as an auditor may be accomplished only during the first week of classes in a semester or summer session. To register as an auditor, students must obtain a **Visitor Permission Form** in the Registrar's Office. This form must be signed by the academic advisor and the course instructor. Regular fees will be assessed for auditing classes. A full-time distinguished student may audit one class free of charge. Any person who is ineligible to register by reason of having been academically dropped may not attend classes as a visitor.

FEES

Fees are subject to change by the Board of Trustees without notice. All fees are payable at the time of registration each semester. (Fees listed are 1980-81 fees.)

Schedule of Fees

Resident undergraduate	$28.25
Nonresident undergraduate	63.50
Resident graduate	37.00
Nonresident graduate	75.00
Laboratory fees	9.00
Registration for examination only	30.00
Registration for degree only	30.00

Note: There may be a fee increase effective Fall 1981.

Estimated basic costs for two semesters for full-time undergraduate students:

	Indiana Residents	**Nonresidents**
University fees	$1,008	$2,065

Books and Supplies	230	230
Total	1,238	2,295

This total does not include the cost of transportation, housing and meals.

Re-admission Fees. Those people who have been dropped by the University for academic reasons are assessed a $50 fee before their application for readmission to the University will be processed.

Late Registration Fees. After classes begin a late registration fee will be assessed each registration at the rate of $5 per course and a $25 maximum always to apply.

Student Service Fees. Undergraduate students enrolled in nine credit hours or more pay a Student Service Fee of $26.00 per semester. This fee is optional for undergraduate students enrolled for eight or fewer credit hours and for all graduate students.

Auditing Fees.

A. Listeners — Persons who are admitted to the University and are registered for courses other than the non-credit courses are assessed fees for the non-credit courses according to their classification, i.e., undergraduate or graduate.
B. Visitors — Persons who are not admitted to the University and are registered only for a course or courses on a non-credit basis are assessed the undergraduate course fee.

Breakage Fees. Course fees include the cost of normal breakage and wear and tear on equipment. An additional charge will be levied against individuals for excessive waste, loss or breakage that may occur. Such special charges must be paid before course credit will be given.

Parking Fees. Parking fees are based on the number of credit hours that a student registers for. The following schedule will prevail:

	Cost per Semester
Students enrolled in nine or more hours	$10
Students enrolled in eight hours or less	5

Graduation Fees. Graduation fees are as follows:

Doctoral degree	$15
Master's degree	10
Baccalaureate degree	10
Associate degree	10
Certificate	5

Graduation fees are payable one week prior to graduation.

Service Fee. Students requesting duplicate copies of their paid receipt forms, etc. must pay a service fee of $1. Replacement copy of the Student Service Fee Card will be one dollar.

Encumbrance Fee. If a student fails to fulfill any financial obligation to various University departments, that student's records will be encumbered and a five dollar fee will be assessed to the student by the department that issues the encumbrance. Prior to the assessment of the encumbrance fee the student will be advised in writing of the outstanding financial obligation and will be given a specified time to settle the account prior to the assessment of the fee.

If a student's records are encumbered because of outstanding financial obligation, that student will not be allowed to register for an additional semester at Purdue University, nor will a student's transcript be released until the financial obligation and encumbrance fee are paid.

Refunds. Course fees (to include regular student fee, laboratory fee, and non-resident fee) will be refunded under any one of the following conditions:

1. Withdrawal during first week of semester, 100 percent refund.
2. Withdrawal during second week of semester, 60 percent refund.
3. Withdrawal during third week of semester, 40 percent refund.
4. Withdrawal during fourth week of semester, 20 percent refund.
5. Withdrawal after fourth week of semester, no refund.

A student who adds and drops classes after the 100 percent refund period will be assessed full fees for the courses added and will be refunded according to the approved refund schedule for the courses dropped. However, a course can be dropped without penalty with approval of the registration officer, if the change is being made for University convenience or for administrative errors.

Students who must withdraw from the University to fulfill a military obligation should contact the Registration Office to ascertain the appropriate refund.

Deposits on equipment are subject to regular service and breakage charges.

Refunds are not transferable from one registration period to another or from one student to another. The same schedule will be applied to listener's, visitor's, and auditor's fees.

To be eligible for a refund, the student must notify in person his academic advisor and complete the necessary withdrawal procedures.

CLASSIFICATION OF STUDENTS FOR TUITION PURPOSES

1. **General.** These regulations establish the principles and procedures by which students shall be classified as residents or nonresidents for tuition purposes at all campuses of Purdue University.
   a. The assessment of tuition and fees for a given session is based upon the student's residence classification as of the first day of classes for that session. Each student classified as a **nonresident** of the State of Indiana is required to pay a tuition fee in addition to the regular fees.
   b. The initial classification of a student for tuition purposes shall continue in effect for subsequent academic sessions unless and until such classification is changed.
2. **Resident Students**
   a. An emancipated student shall be classified as a resident if the student has been domiciled in the State of Indiana for at least twelve (12) consecutive months immediately preceding the beginning date of the academic session for which resident classification is sought.
   b. An unemancipated student shall qualify for resident classification if the student's parent(s) or guardian meet the twelve (12) month domicile requirement. In the case of divorce or separation of the parents, the student shall qualify if either parent meets the domicile requirements.
3. **Definitions.** The following definitions shall be controlling in connection with the interpretation and application of these regulations.
   a. **Domicile:** a person's true, fixed, and permanent home as distinguished from a temporary place of abode; where the individual remains and intends to remain when not called elsewhere for employment, studies, or other special or temporary purposes. A person at one time has but one domicile. A student's domicile is assumed to be that of the parent(s) or guardian until such time as the student becomes emancipated and establishes a separate

domicile. Physical presence in the State of Indiana for the **predominant purpose** of attending an institution of higher education shall not constitute nor necessarily preclude the acquisition of an Indiana domicile, nor shall absence from the State of Indiana for the **predominant purpose** of attending an institution of higher education deprive a person of an Indiana domicile previously established. Ownership of property, payment of Indiana gross income tax; employment; registration as a voter; sources of financial support including income earned in Indiana; membership in civic, community, and other organizations; location of bank accounts; "permanent home" or "home of record" for military personnel; admission to a licensed practicing profession; and all connections or contacts inside and outside of Indiana are some of the factors which may be considered in determining domicile and residence classification for tuition purposes.

b. **Emancipation:** the surrender by parent(s) or guardian of the care, custody, and earnings of an individual, as well as renunciation of parental or guardianship responsibilities, including financial support. A person who is still dependent upon parent(s) or other person(s) in authority, other than spouse, for financial support shall not be considered emancipated for the purpose of these regulations. A person claiming emancipation may be requested to present satisfactory evidence that the parent(s) or guardian have not contributed significantly to the support nor claimed that person as a dependent for federal or state income tax purposes during the period for which emancipation is claimed.

c. **Earned Income:** taxable wages, salaries, professional fees, investment dividends, interest, etc., or equivalent value of support in the form of room and/or board received in return for services rendered. Not included are non-taxable funds received from the University, a governmental agency, or any other agency, or funds such as savings accounts, trust funds, insurance programs, loans, or similar funds.

d. **Guardian:** a person invested with the power, and charged with the duty, of taking care of the person and administering the property and rights of another person. In addition to a court-appointed legal guardian, the term may also include a "natural" guardian, such as a grandparent, aunt, or uncle with whom the person has resided for a period of at least twelve consecutive months and by whom the person has been supported for that same period if the person's parents are deceased or have abandoned the person and if no legal guardian of the person has been appointed.

4. **Specific Provisions**

a. A person who otherwise would be deemed a nonresident shall not gain resident status by reason of marriage; nor shall resident student status be lost by reason of marriage.

b. A foreign citizen shall not be considered for resident classification under these regulations unless such person has been granted legal authorization by the United States Immigration and Naturalization Service to remain in the country as a resident alien.

c. Military personnel, entering Indiana as a result of active duty assignment, shall be eligible for resident classification under these regulations after they have been domiciled in Indiana for twelve (12) consecutive months.

d. Persons and their dependent children who have been domiciled in the State of Indiana for at least twelve (12) consecutive months immediately prior to leaving Indiana temporarily for reasons such as military assignment or employment (normally not to exceed two years) shall be eligible for resident

classification, provided said persons have continually maintained their domicile in Indiana.

e. If an individual establishes an emancipated status for a period exceeding twelve (12) months, that emancipated status shall be deemed permanent for the purposes of these regulations.

5. **Administrative Responsibility for Residence Classification**
   a. The director of admissions, or a designee, shall determine the initial residence classification of each undergraduate student at the time the student enters or re-enters the University.
   b. The dean of the graduate school, or a designee, shall determine the initial residence classification of each graduate student at the time the student enters or re-enters the University.
   c. All residence reclassifications shall be determined by the registrar or a designee.
   d. Persons responsible for determining residence classification are authorized to require such certificates, affidavits, documents or other evidence as they deem necessary. In all cases, the burden of proof shall be upon the student making a claim to resident student status.
6. **Changes from Nonresident to Resident Status**
   a. If a student is classified as a nonresident, either the student or the University may initiate a reclassification inquiry. However, it is the responsibility of the student to apply to the registrar for reclassification to resident status if the student believes that changes in facts justify such a reclassification.
   b. The student may submit such an application in writing, on a form approved by the registrar, any time after the appropriate domiciliary requirements have been met, but no later than 15 days after the day on which classes begin for the academic session for which reclassification is sought. The registrar shall render a decision no later than 30 days after the application is filed.
7. **Changes from Resident to Nonresident Status**
   a. If a student is classified as a resident, either the student or the University may initiate a reclassification inquiry, based on changes in facts which would justify such an inquiry.
   b. If the parent(s) or guardian of a resident student establish a domicile outside the State of Indiana for a period of twelve (12) consecutive months, the student shall be reclassified to nonresident status at the end of that twelve month period unless the student can show evidence of emancipation at the time of the parents' change in domicile and that the student has continuously maintained a separate domicile in Indiana during the cited twelve month period.
   c. If an emancipated student establishes and maintains a domicile outside the State of Indiana for a period fo twelve (12) consecutive months, the student shall be reclassified to nonresident status at the end of the cited twelve month period.
   d. A reclassification initiated as a result of item b or c above shall be effective beginning with the first academic session following the twelve month period.
8. **Failure to Provide Adequate Information.** A student who fails to notify the University of a change of facts or provides false information which might effect classification or reclassification from resident to nonresident status, shall be required to pay retroactively any tuition fees which would normally have been assessed. In addition, a student who provides false information or conceals information for the purpose of achieving resident status may be subject to appropriate disciplinary action, as well as other penalties which may be prescribed by law.

9. **Residence Classification Review**
   a. A student who is not satisfied with a determination concerning the residence classification may request that the responsible officer reconsider the determination. Such a request for reconsideration must be made within fifteen days after the receipt of written notification of the official decision.
   b. If the student is still not satisfied with the determination after it has been reconsidered, the student may appeal the decision to the Residence Review Committee. The appeal shall be in writing and shall include reasons for the appeal and a complete statement of the facts upon which the appeal is based, together with supporting affidavits or other documentary evidence. The appeal must be filed within thirty days after the first day of classes of the academic session for which the determination is effective or within thirty days after the original decision has been reconsidered, whichever occurs later. Failure to file such an appeal within the specified time limit shall constitute a waiver of all claims to reconsideration for that academic session.
   c. Consistent with the general intent and purpose of these regulations, the committee may uphold or reverse the decision of the classifying official. The decision of the committee in all cases shall be final.
10. **Residence Review Committee**
   a. A Residence Review Committee shall be appointed by the president of the University. Persons otherwise responsible for determining residence classification of students may assist the committee in a consultive capacity.
   b. The functions of the committee shall be (1) to review decisions relative to residence classification, when appealed, and to make final decisions relative to such cases, and (2) to recommend to the president amendments to these regulations.

STUDENT SERVICES

OFFICE OF THE DEAN FOR STUDENT DEVELOPMENT

The Dean for Student Development has the responsibility for the administration of certain programs of the University concerned with the general welfare of the student body. Offices coordinated by the Dean include: Counseling and Developmental Programs; Career Development and Placement; Student Activities; Intramural, Athletic, and Recreational Programs; Health Services; and TRIO programs. To help students move towards reaching their intellectual, social, and personal potential is a commitment of the staff.

The Dean has the responsibility for interpreting campus rules, practices, policies and regulations as they affect the quality of student life. Readmissions, disciplinary concerns, approved housing, emergency loans, honor societies, student government, and a full complement of University services are coordinated by the office. We strive to understand the attitudes and views of students and to communicate these concerns to others having responsibility for policies affecting student life.

COUNSELING AND DEVELOPMENTAL PROGRAMS

The Office of Counseling and Developmental Programs provides a variety of services to individuals, couples, groups and families. The focus is on crisis intervention and developmental counseling. Individuals are helped to deal with personal, social and

academic concerns, as well as career development and life planning. Specifically, counselors provide a supportive environment in which individuals may work on such issues as family problems, marital discord, stress, decision-making, conflict resolution, drug and alcohol abuse and other personal concerns, individually and in groups.

In order to enhance self and other awareness, Personal Growth and Development seminars are offered. Mastering such skills will enable students to cope with their life situations more effectively. These seminars include: Time Management, Study Skills Development, Coping With Stress, Test Anxiety Management, Introduction to Assertiveness Training, Smoking Cessation, Women In Work, Problem Solving and Decision Making, Initiating and Maintaining Relationships, etc. In addition, mini-courses are offered to provide a more intensive experience for those persons who need a longer period of time for personal exploration.

The Counseling Center also offers testing services and educational counseling to those students who are undecided about college majors; those who have not chosen tentative career goals, and/or those who have academic deficiencies or other problems in academic areas.

In Counseling and Developmental Programs, particular attention is given to the mature woman who returns to school after a long absence. Counseling may focus on time-management, parenting, the development of good study habits, and guilt feelings which often accompany the return to school for such students.

The Career Clinic is a service provided through the Counseling Center to high school students and other persons in the Purdue Calumet Community. Each person is provided career counseling for a fee. Those interested should call the Center for further information.

CAREER DEVELOPMENT AND PLACEMENT

The Career Development and Placement Office at Purdue Calumet serves students who are interested in either full-time or part-time employment. Job listings are maintained on a daily basis for students' use. Prospective employers are encouraged to interview students at the Campus prior to graduation. Undergraduates are assisted in finding part-time work and summer employment which bring needed revenue and often provide valuable experience. Alumni seeking positions may also avail themselves of the placement services.

A new addition to the Career Development and Placement Office is the Career Resource Center which is located next to the Career Development and Placement Office in Room C341. The Career Resource Center provides information on occupations in business, industry, and government. Students interested in graduate school will find reading materials on where, when, and how to apply to graduate schools throughout the country.

The Voluntary Action Center was established in order to offer students the opportunity to be of genuine service to their communities as well as integrating practical work experience with their university studies. The office maintains a growing list of agencies and organizations from which students may choose a position that meets their needs as well as instructional courses which offer credit for field experiences. The Center is affiliated with Lake Area United Way and is administered by the office of Career Development and Placement.

STUDENT ACTIVITIES

Social and cultural development, leadership experience, and cooperative planning are as much a part of a college education as are academic classes. Through involvement

in the forty-five campus organizations, students participate in a lively interchange of ideas, values, lifestyles, and social experiences.

Collegiate affiliates of professional societies support academic and career objectives. Special interest clubs allow participation in a wide range of endeavors. Fraternities and sororities encourage fellowship and service to the community. Creative and spiritual development is fostered by theater, music and religious organizations. Ethnic associations promote and protect the concerns of its members.

The Student Government Association participates in the decision-making process of the University in addition to providing free legal services. Concerts, films, speakers and social extracurricular activities are under the purview of the Student Programming Board. **Tell Me More,** the campus news-magazine, is written, edited and published by students in order to express opinion and present news and features of interest to the campus community.

INTRAMURAL, ATHLETIC, AND RECREATIONAL PROGRAMS

INTRAMURALS AND RECREATION

The newly occupied Physical Education-Recreation Building serves as the base for a broad offering of intramural athletics in several sports areas and open recreation for students and staff. The main gym with three full size basketball courts, the auxiliary gym, weight room and racquetball courts are available throughout the day and night for general use. An indoor running track is also a popular feature of the complex.

INTERCOLLEGIATE ATHLETICS

The men's and women's teams compete in volleyball and basketball (women), and soccer, golf and basketball (men) with expansion into other sports anticipated as facilities are added. The men's program competes under National Association of Intercollegiate Athletics auspices while the women's program is a member of the Association for Intercollegiate Athletics for Women.

HEALTH CENTER

The Student Health Center is open to both full- and part-time students. Appointments can be arranged with many local physicians but students must be responsible for their own bills. Emergency first-aid is given in the Health Center (or by the University Police if the Health Center is closed) and city ambulance service is used for transportation to local hospitals.

TRIO PROGRAMS

The TRIO Programs are educational opportunity programs. Their primary purpose is to provide academic and supportive services to non-traditional students. At Purdue Calumet, the TRIO Programs consist of Upward Bound and Special Services.

Upward Bound

Upward Bound is a pre-college preparatory program that provides academic support, cultural enrichment, and personal and career counseling. The program is designed to increase the academic skills and motivational levels of the participants so that they can overcome economic and academic barriers to a successful college education. Students are identified and selected during their sophomore year in high school. Program components include:

1. Summer phase — six-week residential at the West Lafayette Campus during the pre-junior summer; eight-week non-residential at the Purdue Calumet during the pre-senior summer.
2. Academic Year Phase — students attend classes and participate in career planning sessions and other activities on Saturdays at Purdue Calumet.

Upward Bound helps to prepare students for bridging the gap between youth and adulthood.

Special Services

The department of Special Services provides supportive services for students who are eligible. Eligibility criteria are physical disability, limited use of English, educational or cultural need, and low income. Services offered include counseling, readers for blind students, notetakers for the hearing impaired, writers and attendants for students with motor disabilities and tutorial assistance.

Laboratories for assistance in reading, writing, English as a second language, and math are provided, in addition to individual tutoring available for all courses. Entering freshmen have the opportunity to participate in an eight-week summer orientation program.

TUTORING

The School of General Studies administers a program under which tutoring is available to all students who need extra help in their course work. The tutoring is done either in small groups or on an individual basis. Tutoring may be free, or there may be a charge, depending on need. The tutoring staff generally consists of undergraduate or graduate students who are academically qualified in a particular discipline and are recommended by the department concerned.

Any faculty member, academic advisor, or Dean of any School may refer a student for this service to the Tutoring Center. A student may also avail himself of tutoring through self-referral. Faculty and students are encouraged to apply for the tutoring service early in the semester to get maximum benefit from the program.

OFFICE OF VETERANS' AFFAIRS

Many services are available to veterans on campus and in the Calumet area through Purdue Calumet's Office of Veterans' Affairs. Located in the Gyte Building within the Registrar's Office, the OVA has full-time staff members available to assist veterans. OVA services include benefits, advising, career testing and counseling, personal counseling and referral when necessary.

WEEKEND COLLEGE

In addition to day and evening offerings, credit courses toward degrees are offered on the weekend. At the present time associate degrees in both supervision and computer programming can be earned by attending the Weekend College. Interested students should consult the class schedule for specific courses.

DAY CARE CENTER

Day care services for pre-school children are available to students and staff. For further information, contact the Department of Behavioral Sciences.

GRADING

ASSIGNING OF GRADES

Students are responsible for the completion of all required work by the time of the last scheduled class meeting unless the course has been properly cancelled. At the close of a session, students will receive from their instructors a grade in each course in which they are enrolled. This grade will indicate the student's achievement with respect to the objectives of the course.

For credit courses:

A — highest passing grade.
B
C
D — lowest passing grade; passing minimal objectives of the course.
E — conditional failure; failure to achieve minimum objectives, but only to such limited extent that credit can be obtained by examination or otherwise without repeating the entire course. This grade represents failure in the course unless and until the record is duly changed within one semester. It cannot be changed to a grade higher than a D.
F — failure to achieve minimal objectives of the course. The student must repeat the course satisfactorily in order to establish credit for it.

For courses taken under the pass/not pass option:

P — passing grade; equivalent to grade of A, B, or C.
N — not passing.

For zero credit courses (including thesis research but not including laboratory portions of courses in which, for purposes of scheduling, separate course designations are used for the laboratory sections);

S — satisfactory; meets course objectives.
U — unsatisfactory; does not meet course objectives.

For incomplete work, either credit or noncredit:

I — incomplete; no grade; a temporary record of work that was passing when interrupted by unavoidable absence or other causes beyond a student's control. An instructor may require the student to secure the recommendation of the Dean for Student Development or his designee that the circumstances warrant a grade of incomplete. The student must achieve a permanent grade in the course no later than the twelfth week of the second subsequent semester of enrollment, or the I will become an IF.
PI — incomplete; no grade; same as I except that student was enrolled under the pass/not pass option.

Directed grades. The Registrar is directed to record the following grades and symbols under special circumstances:

W — Withdrew; a record of the fact that a student was enrolled in a course and withdrew or cancelled the course after the third week (1½ weeks in a Summer Session).
WF — Withdrew Failing: a record of the fact that a student was enrolled in a course and withdrew or cancelled the course after the ninth week at which time, according to a statement from the instructor, the student was not passing. This grade counts in all respects as a failing grade. A grade of WF may be directed by the Scholastic Readmissions Committee.
WN — Withdrew Not Passing: the same as WF for a course taken under the pass/not pass option except that it does not affect index computation.

IF — Unremoved Incomplete — Failing: for a course in which a student received an I, a directed record of the student's failure to achieve a permanent grade by the twelfth week of the second subsequent semester of enrollment. This grade counts in all respects as a failing grade.

IN — Unremoved Incomplete — Not Passing: for a course taken under the pass/not pass option and in which a student received a PI, a directed record of the student's failure to achieve a permanent grade by the twelfth week of the second subsequent semester of enrollment. Otherwise the same as the IF except that it does not affect index computations.

IN GOOD STANDING

For purposes of reports and communications to other institutions and agencies and in the absence of any further qualification of the term, a student shall be considered in good standing unless he has been dismissed, suspended or academically dropped from the University and has not been formally re-admitted.

SCHOLARSHIP INDEXES

The scholastic standing of all regular students enrolled in programs leading to an undergraduate degree shall be determined by two scholarship indexes, the **semester index** and the **graduation index.**

1. The semester index is an average determined by weighing each grade received during a given semester by the number of semester hours of credit in the course.
2. The graduation index is a weighted average of all grades receivd by a student while in the enrolled curriculum plus all other grades received in courses taken in other curricula offered by the University and properly accepted for satisfying the requirements of the School in which the student is enrolled. With the advisor's consent, a student may repeat a course. In the case of courses which have been repeated or in which conditional grades have been removed or for which a substantially equivalent course has been substituted, the most recent grade received (excepting I) shall be used.
3. For the purpose of averaging, each grade shall be weighted in the following manner:

A — 6 x semester hours = index points
B — 5 x semester hours = index points
C — 4 x semester hours = index points
D — 3 x semester hours = index points
E, F, WF, IF — 2 x semester hours = index points
I, PI, W, WN, IN, P, N, not included

Graduation Index Requirement

For the bachelor's degree: the required minimum graduation index is 4.00.
For the associate degree: the required minimum graduation index is 3.90.

SCHOLASTIC PROBATION

A candidate for an associate or baccalaureate degree shall be placed on probation if the candidate's semester or graduation index at the end of any semester is less than that required for a student with a classification as shown in Table A. A student on probation shall be removed from that status at the end of the first subsequent semester in which the semester and graduation indexes are equal to or greater than those required

for a student with a classification as shown in Table A. Any grade change due to a reporting error will require reconsideration of probation status.

Probation is concerned only with the regular semesters and not with summer sessions and intensive courses.

TABLE A. INDEX LEVELS FOR PROBATION

S = Semester Index; G = Graduation Index

Classification	S	G
1	3.5	3.5
2	3.5	3.5
3	3.6	3.75
4	3.6	3.90
5	3.7	3.95
6	3.7	4.0
7	3.7	4.0
8 and up	3.7	4.0

DROPPING OF STUDENTS FOR SCHOLASTIC DEFICIENCY

A student on scholastic probation shall be dropped from the University if at the close of any semester, the semester or graduation index is less than that required of a student as shown in Table B. This rule shall not apply for the semester in which the student completes all requirements for a degree. A student dropped by this rule and later duly re-admitted as a regular student shall be re-admitted on probation.

TABLE B. INDEX LEVELS FOR DROPPING

S = Semester Index; G = Graduation Index

Classification	S	G
1	3.2	3.2
2	3.3	3.3
3	3.4	3.5
4	3.4	3.6
5	3.5	3.7
6	3.5	3.8
7	3.5	3.85
8 and up	3.5	3.9

REQUIREMENTS FOR GRADUATION

To gain a baccalaureate degree from Purdue University, a student shall satisfy the following requirements:

1. The completion, either by resident course work, by examination, or by credit accepted from another institution, of the plan of study underlying the degree. Deans of Schools may refuse to accept as credit toward graduation any course which was completed ten or more years previously. Former students shall be notified immediately of all such decisions upon re-entering. Substitutions of courses required for graduation may be made by the Dean of the School in which the student is registered.
2. Resident study at Purdue University for at least two semesters and the completion during this period of at least 32 semester hours of work in courses regularly open to third or fourth year students, i.e., courses numbered 300 to 599. Students are normally expected to complete the senior year in residence;

however, with the approval of the Dean of the School concerned, students who have had at least four semesters of resident study may complete not to exceed 20 semester hours of the senior year in another approved college or university. For the purpose of this rule, two summer sessions shall be considered as equivalent to one semester.

3. Registration, either in residence or in absentia, as a candidate for the desired degree during the semester (or summer session) immediately preceding its conferral.
4. A minimum graduation index of 4.00. A student who has completed all other requirements for a bachelor's degree but has failed to meet the quality requirement may register for additional courses with the approval of an authorized representative of the Dean of the appropriate School after a review of the student's record. The additional courses which the student may take after meeting all quantity requirements shall not exceed 20 credit hours. Such a student may take in another approved college or university not more than nine of the 20 credit hours permitted, provided such courses are approved in advance in writing by an authorized representative of the Dean of the appropriate School. A copy of such approval must be filed in the Office of the Registrar. Credit in these additional courses must be established within five years of the date on which all degree requirements except the minimum graduation index were met. The quality requirement for graduation will be met if the student's graduation index, including the above extra courses, meets the quality standard in effect at the time when all other graduation requirements were satisfied.
5. The payment of the graduation fee to the Bursar on such date as may be specified preceding the end of the session.
6. All students admitted to a school for the fall of 1979 or thereafter, shall demonstrate proficiency in the English language by passing a composition examination, which shall be offered at least once each semester. The Deans of the Schools shall not allow any of their students to graduate who have not met this requirement.

   In addition, an instructor will advise any sophomore, junior, or senior student markedly deficient in composition skills to attend the Writing Laboratory where, for a nominal fee, the student may work at specially designed writing programs.

To gain an associate degree from Purdue University, a student shall satisfy the following requirements:

1. The completion, either by resident course work, by examination, or by credit accepted from another institution, of the plan of study underlying the degree. Deans of Schools may refuse to accept as credit toward graduation any course which was completed ten or more years previously. Former students shall be notified immediately of all such decisions upon reentering. Substitutions of courses required for graduation may be made by the dean of the school in which the student is registered.
2. Resident study at Purdue University for at least two semesters and the completion during this period of at least 32 credit hours. Students are normally expected to complete the entire second year in residence; however, with the approval of the Dean of the School concerned, students who have at least three semesters of resident study may complete at most 16 credit hours of the second year in another approved college or university. For the purpose of this rule, two summer sessions may be considered as equivalent to one semester.

3. Registration, either in residence or in absentia, as a candidate for the desired degree during the semester (or summer session) immediately preceding its conferral.
4. A minimum graduation index of 3.90. A student who has completed all other requirements for an associate degree but has failed to meet the quality requirement may register for additional courses with the approval of the Dean of the appropriate School after a review of the student's record. The additional courses which the student may take after meeting all quantity requirements shall not exceed ten credit hours. Credit in these additional courses must be established within three years of the date on which all degree requirements except the minimum graduation index were met. The quality requirement for graduation will be met if the student's graduation index, including the above extra courses, meets the quality standard in effect at the time when all other graduation requirements were satisfied.
5. The payment of the graduation fee to the bursar on such date as may be specified preceding the end of the session.
6. All students admitted to a school for the fall of 1979 or thereafter shall demonstrate proficiency in the English language by passing a composition examination, which shall be offered at least once each semester. The Deans of the Schools shall not allow any of their students to graduate who have not met this requirement.

   In addition, an instructor will advise any sophomore student markedly deficient in composition skills to attend the Writing Laboratory where, for a nominal fee, the student may work at specifically designed writing programs.

DISTINGUISHED STUDENTS

At the conclusion of each semester, the Registrar shall indicate which regular undergraduate students were distinguished in their scholastic work as indicated by the grades they received at the close of the semester. Suitable publicity shall be given to the names of these students. The list of distinguished students will be published as the Academic Honors List. To be cited as a distinguished student in any semester, one must:

1. Complete successfully all the assigned courses with a grade of C, P, or better, except any that may have been cancelled without a semester grade.
2. Complete at least 12 semester hours.
3. Attain a semester index of at least 5.50. (Credit hours earned with a grade of P will not be used in determining the semester index, but will be counted as part of the minimum 12 hours required.)

Students whose names are placed on the list of distinguished students shall be entitled to the following special privileges during the semester following the designation of distinction:

1. Exemption from Academic Regulation 5-B-1. A distinguished student will be assigned to more than 18 credit hours upon request.
2. With the instructor's permission a full-time distinguished student may audit one class without assessment of an additional fee.

GRADUATION WITH DISTINCTION

Degrees are awarded at the end of each semester and summer session to candidates who have completed the requirements of their schools. At each of these periods degrees with distinction are awarded to those completing the undergraduate plans of study under the following conditions:

1. Distinction at graduation shall be awarded on the basis of the graduation index. Baccalaureate degrees with distinction shall be granted to persons who complete at least three years at Purdue University, complete all the requirements for the major in their area, and meet the requirements of paragraphs two through five below. Those persons qualifying after three years must be in programs approved for exception.
2. A candidate for the baccalaureate degree with distinction must have earned at least 65 hours of credit at Purdue University. A candidate for an associate degree with distinction must have earned at least 35 hours of credit at Purdue University.
3. To qualify for distinction a student's graduation index must be at least 5.30.
4. If the number of graduates in any School who qualify for distinction under rules one through three exceeds one-tenth of the total number of graduates from the School for that semester or summer session, the number of degrees with distinction shall be limited to one-tenth of the class in that School, and those graduates with highest indexes shall be included. In administering this rule, all associate degree graduates will be considered as one School.
5. Of those students who qualify for distinction under these rules, the three-tenths of the baccalaureate graduates having the highest indexes shall be designated as graduating with highest distinction, irrespective of the schools to which they may belong. The three-tenths of the associate degree graduates having the highest indexes will be designated as graduating with highest distinction.

GRADUATE STUDY

Graduate programs at Purdue University Calumet provide qualified students the opportunity to complete all requirements for a master's degree in various fields of study, as listed below. Since graduate programs at Purdue Calumet operate under the supervision of West Lafayette Campus departments, individual Calumet graduate courses supply credit according to qualifications established for the entire University. Only courses approved by a student's advisory committee and by the dean of the Graduate School may form the plan of study for the master's degree.

ADMISSION

Regular (Degree-Seeking) Graduate Students

Applicants for regular admission may apply through the Graduate School Office at Purdue Calumet. Applications will then be considered by the Purdue Calumet department that will provide the program, by the department at the West Lafayette Campus which administers the graduate degree program, and by the Graduate School. Applicants must submit two complete official transcripts of all previous college and university studies and any other documents a department may require. Applicants should show promise of ability and hold a baccalaureate degree from an accredited

institution. The minimum standard for unconditional admission to the Graduate School has been established as a graduation grade point index of 5.0 or equivalent (A is 6 points, B is 5 points, etc.). Individual departments and schools may set higher grade point requirements and may require the submission of additional evidence of academic performance. After admission, degree candidates must follow a formal plan of study (see Advisory Committee and Plan of Study sections).

Postbaccalaureate, Nondegree Enrollment.

The subclassifications include:

1. *Postbaccalaureate registrant.* this classification is intended for those who wish to pursue study beyond the baccalaureate degree but do not have specific degree objectives. It is not intended to be a form of probationary admission to a regular degree program. It is possible for those registered in this classification to be considered for admission to the Graduate School as regular graduate students.

   Not more than nine hours of credit may be applied to an advanced degree program if an individual is later admitted as a regular graduate student. However, if an application to a regular degree program is approved during the session in which a person is enrolled for the ninth credit hour as a nondegree registrant, then all credits taken prior to and during that term will be eligible for inclusion on a plan of study for a degree program, providing the courses are appropriate to the degree program and acceptable to the department and the Graduate School. No course in which a grade of less than "B" has been received will be permitted on a plan of study if the course was taken while enrolled as a nondegree registrant. Nondegree registrants may be required to secure consent from each of the departments in which they would like to register for courses.
2. *Teaching license registrant.* This classification is intended for baccalaureate degree holders seeking to work on teacher license programs without degree objectives, following an advanced degree program.

Graduate Record Examination

Among those who apply for regular admission to the Graduate School, any applicant in one or more of the following categories must take the Aptitude Test Section of the Graduate Record Examination (GRE):

1. Those who hold a baccalaureate degree from a nonaccredited institution;
2. Those who feel their previous academic record does not adequately reflect their ability;
3. Those who are applying for admission to a department with such a requirement; for example, the Department of History requires that all applicants take the aptitude section of the GRE;
4. Those who are to be considered for a fellowship or traineeship appointment.

The Educational Testing Service, Box 955, Princeton, New Jersey, 08541, can advise applicants of testing dates and locations. Currently the GRE examination is being given at Purdue Calumet twice a year, during spring and fall semesters. Contact the Purdue Calumet Graduate Office, Room 0-352, for applications and further information.

When to apply

In most departments, admission may be granted for the beginning of the first or second semester or the summer session. The effective date of admission to a regular

degree program shall be the first day of the session following the date the application is received for review by the Assistant Dean of the Graduate School at Purdue Calumet.

Undergraduate students should normally apply early in the last semester of their senior year. If the Graduate Record Examination is involved, it is taken, preferably, during the first semester of the senior year. Applications, transcripts, and supporting letters should be submitted to the major department at least four months before the beginning of the session for which admission is sought.

An applicant is not officially admitted until notification has been received from the dean of the Graduate School. After the faculty members in the major department have reviewed the applicant's credentials, their recommendation is forwarded to the dean of the Graduate School, who reviews the recommendation, takes final action on the application, and notifies the applicant officially of the action taken. *There is no application fee.*

Additional Information Concerning Admission.

Correspondence about admission to the Graduate School should be addressed to the head of the department in which the applicant desires to be admitted or to the Graduate School Office, Purdue University Calumet, Hammond, Indiana 46323. Inquiries about specific departmental requirements should be addressed to the departments in which the student expects to study. Some departments have brochures which describe their programs and special requirements.

GENERAL REGULATIONS

Standards of Work

Success in graduate study requires performance of a high quality. Only grades of A, B, or C are acceptable in fulfilling Graduate School requirements on any plan of study. An advisory committee may require higher performance than C in certain courses. Pass-fail grades are not acceptable.

The graduate student is expected to perform on a high academic level. The student's progress will be reviewed each semester by both the dean of the Graduate School and the department of the major. Should the student fail to perform on a level satisfactory to the advisory committee or to the dean of the Graduate School, the student may be asked to discontinue graduate study at Purdue.

The same scholastic requirements in effect during the regular University year apply to graduate study in the summer session. The same grade standards apply to required prerequisite courses.

English Requirement

All degree-seeking graduate students are required to demonstrate a proficiency in English composition before filing a plan of study. Candidates for advanced degrees whose native language is English satisfy the English requirements (1) if they made no grade below B in graded undergraduate courses in composition prior to graduate admission (pass/no pass or "s" grades are not acceptable), or (2) if they make scaled scores of 600 or higher on the Verbal Aptitude Section of the Graduate Record Examination, or 36 or higher on the verbal portion of the Graduate Management Admission Test.

Those not cleared as specified above write test papers for the Writing Review Committee and are held for further writing if the test papers are not acceptable. Students so held are expected to work toward satisfying the requirement without delay.

Foreign Language Requirement

The Graduate School has no general foreign language requirement for the master's degree. Some departments, however, do require a reading knowledge of a foreign language. Normally, the required foreign language will be pertinent to the field of study, since the principal purpose is that the language should serve as a research tool.

Undergraduate and Transfer Credit

Students may apply credits earned beyond the baccalaureate degree at Purdue or elsewhere toward an advanced degree. The schools and departments of the University determine the conditions of such credit transfer, except that no credit transfer can be allowed toward the master's degree before a student completes one semester of satisfactory work at Purdue.

Advisory Committee

For each prospective candidate for the master's degree there shall be appointed an advisory committee consisting of three members, except in unusual circumstances. The duties of this committee are to assist the student in the preparation of a plan of study and to advise the student during the period of graduate work. In the case of the thesis option, the committee also advises the student regarding research and writing of the thesis. The student, with the approval of the head of the major school or department, shall select a major professor. The major professor-student relationship must be a mutually acceptable one. When selected, the major professor will act as the chairman of the student's advisory committee and be in charge of the research. The major professor and the student shall agree upon the related areas, from each of which they will choose one professor to serve with the major professor on the advisory committee. Other members of the major department may also be added. The advisory committee as agreed upon by the major professor and the student, with the approval of the heads of the departments of the primary and related areas, shall be presented to the dean of the Graduate School for his approval and formal appointment. The dean may appoint additional members if it seems advisable.

Plan of Study

The plan of study shall include a primary area and a related area or areas which are chosen on the basis of the student's interests and needs. A tentative plan of study should be drawn up in advance of registration for the first semester of graduate work, and the formal plan of study should be submitted to the dean of the Graduate School before the final semester, preferably during the first semester in residence.

The plan shall be appropriate to meet the needs of the student in the chosen field as determined by the advisory committee and approved by the department head and the dean of the Graduate School. It shall include the specific courses the student is expected to complete and all other requirements of the particular master's degree which is sought. The various departments shall determine the courses which may be used.

Admission to Candidacy

Admission to candidacy for the master's degree is granted only after approval of the formal plan of study. A candidate for any advanced degree must be registered during the semester in which the degree is to be awarded. The diploma fee must be paid before noon on the Friday preceding graduation, or earlier by special announcement.

Oral and Written Examinations

The Graduate School has no general requirements for oral or written examinations for the master's degree. These are established by the advisory committee or the department. A final examining committee appointed for each candidate must certify to the Graduate School that the student has met the requirements of the major department.

Additional Information

Consult the Graduate School bulletin for further information concerning regulations and descriptions of courses.

PRINCIPAL AREAS OF GRADUATE STUDY

The University has approved the following master's degree programs for Purdue University Calumet.

1. Master of Arts in Teaching (major in mathematics)
2. Master of Arts (major in English)
3. Master of Arts (major in American or European history)
4. Master of Science (in Biology)
5. Master of Science (in Biology Teaching)
6. Master of Science (major in mathematics, option for teachers)
7. Master of Science (in the application of mathematics)
8. Master of Science in Education in:
   a. Administration
   b. Media Sciences
   c. Elementary Education
   d. Counseling and Personnel Services
   e. Secondary Education with areas in biology, chemistry, communications, educational media, English, foreign languages, history, industrial education, mathematics, physics, physical education, political science, and sociology.
9. Master of Science (major in Engineering)
10. Master of Science in Engineering
11. Master of Science in a specific engineering field, (e.g., Electrical Engineering, Industrial Engineering, Mechanical Engineering)
12. Master of Science (in Management)
13. Master of Arts in Teaching Economics

The above programs are completely available at Purdue Calumet. In addition, Purdue Calumet offers portions of other graduate programs. Contact the Purdue Calumet Graduate Office for additional information.

GRADUATE PROGRAMS IN BIOLOGY

The Department of Biology, Purdue Calumet offers a non-thesis Master of Science program. Within that program there are two options, in Biology and in Biology Teaching. Students may select a sequence of courses designed to meet individual professional needs and interests.

Admission

1. Baccalaureate degree from an accredited institution of higher learning; transcripts must be submitted.
2. Graduate Record Examination (verbal and quantitative aptitude tests).
3. Three (3) letters of recommendation.

General Information

Minimum grade, index, and credit requirements: A, B, and C grades only will be accepted; cumulative index must be 4.8 or higher. The non-thesis option requires a minimum of 30 semester hours, of which 21 must be in 500-level courses (B average) and 9 in a secondary area (may be below 500-level).

Time limitations: Requirements for M.S. degree may not be completed in less than two (2) nor more than ten (10) semesters (5 years) of work at Purdue Calumet.

Transfer of credit: Up to three (3) courses of transfer credits for graduate work completed at other accredited institutions no more than ten (10) years prior to completion of the degree program will be evaluated for possible acceptance.

Comprehensive examination: The Graduate Advisory Committee will administer a comprehensive written examination early in the semester preceding the semester in which the candidate expects to graduate, or at a time deemed appropriate by the Graduate Advisory Committee. Students who do not successfully complete this examination may be given a second opportunity for examination during the following semester.

The student must choose a primary area of at least 21 credit hours and a secondary or supporting area of nine hours. Courses in the primary area must be at the 500-level or above; this limitation does not apply to courses in the supporting area. It is expected that the Major Professor and Graduate Advisory Committee will work closely with the student to design a cohesive, academically meaningful program suited to the goals and career expectations of the student.

A one-credit hour seminar in biology is required of all M.S. candidates (offered each year).

Secondary area courses for the M.S. (in Biology) may be chosen from related areas such as statistics, computer science, chemistry, or physics. Secondary area courses for the M.S. (in Biology Teaching) should be in education.

Graduate Courses

The following courses are available at Purdue Calumet on a rotating basis:

BIOL 505	Biology of Invertebrate Animals (Cr. 4)
BIOL 522-3	Cytology (Cr. 4)
BIOL 524-5	Microbiology (Cr. 4 or 5)
BIOL 527-8	General Mycology (Cr. 3 or 5)
BIOL 533-4	Medical Microbiology (Cr. 5)
BIOL 541-2	Genetic Biology (Cr. 4)
BIOL 551-2	Plant Physiology (Cr. 5)
BIOL 560	Plant Structure (Cr. 4)
BIOL 566-7	Developmental Biology (Cr. 4)
BIOL 574	Plant Taxonomy (Cr. 4)
BIOL 575-6	Systematic Biology (Cr. 4)
BIOL 580	Evolution (Cr. 3)
BIOL 587	Biogeography (Cr. 3)

BIOL 588-9	Plant Ecology (Cr. 4)
BIOL 591	Field Ecology (Cr. 4)
BIOL 593	Ethology (Cr. 4)
BIOL 595	Special Assignment: Morphology of Vascular Plants (Cr. 3)
BIOL 595	Special Assignment: Herpetology (Cr. 3)
BIOL 595	Special Assignment: Microtechniques (Cr. 3)
BIOL 595	Special Assignment: Palynology (Cr. 3)
BIOL 595	Special Assignment: Immunology (Cr. 4)

GRADUATE PROGRAMS IN EDUCATION

The Master of Science degree in Education is designed to provide graduate students an opportunity to broaden and strengthen their academic backgrounds, as well as to increase professional competence.

A plan of study includes advanced professional courses in areas of particular interest, plus foundation courses in educational psychology, history and philosophy of education and educational measurement. Each program is individually planned, in keeping with the student's certification requirements and professional interests.

For additional information regarding graduate programs in education, contact the Graduate Education Office, Gyte Annex 151.

Elementary Education

The program provides opportunities to pursue general elementary education and areas of special interest related to elementary education. This plan allows study in related professional areas such as remedial reading, guidance, educational media or library services, special education, or supervision and administration, as well as in other academic areas of interest to elementary teachers.

Secondary Education

The graduate program includes, in addition to the foundation courses required of all master's degree candidates, electives related to the student's interests and educational objectives. Conversion of the initial Indiana teaching certificate (provisional or standard license) to a professional teaching certificate requires the completion of appropriate course work in the major, minor and/or endorsement areas. These courses are usually included in the master's degree program. Students should consult with an academic advisor concerning the planning of their individual programs.

Educational Administration

The master's degree in educational administration includes basic courses in administration and supervision, as well as electives in selected academic areas. Such a program is appropriate for individuals planning a career in a variety of leadership positions in education.

The program provides an opportunity to earn a Master of Science in Education Degree with a concentration in educational administration and supervision and leads directly into the certification program for school administrators. The approved certification program consists of 45 semester hours of prescribed graduate study. Students should consult an advisor regarding their specific programs.

Media Sciences

The master's degree program in the media sciences is designed to provide the student with experience in both print and nonprint media. Students graduating in this

program will be qualified for a variety of positions in elementary and/or secondary education media centers. Graduates will also meet Indiana's certification requirements in school library and audio-visual services. The plan of study includes the education foundation courses and a basic core of media sciences and reference resources. Additional electives are available in the media sciences, communication and other academic areas. Programs leading to the professionalization of the provisional certificate can be followed at Purdue Calumet as courses are available.

Counseling and Personnel Services

Students who complete the graduate program in counseling and personnel services will be qualified for positions as counselors and student personnel workers. Graduates accept placement in a variety of settings, such as public and private schools, higher education, and community, social and private agencies.

Courses in the major sequence provide concentration in counseling and guidance principles, counseling theory and techniques, career development and information, human relations laboratory, group counseling, testing and evaluation, and counseling practicum. The plan of study also includes educational foundations and a minor sequence. Graduates can arrange their degree program to qualify for Indiana "School Services Standard License-Counselor". In addition, advanced study is available which can lead to professionalization of the standard license.

ENDORSEMENTS

Endorsements in Instructional Supervision-Reading and Special Education-Learning Disabled/Neurologically impaired are available at the graduate level. A professionalized license in reading is a prerequisite to obtaining certification in Instructional Supervision-Reading. The Special Education endorsement in Learning Disabled/Neurologically Impaired may be used to professionalize an existing license in special education or may be added to a Standard License in elementary or secondary teaching. A program for adding a minor in special education is also available to those who hold a professional teaching license in an area other than special education. An endorsement may be pursued as part of a mster's degree or completed as a post-graduate program. Programs in educational media, counseling and personnel services, and educational administration may also be completed at the post-graduate level.

GRADUATE PROGRAM IN ENGINEERING

The Department of Engineering at Purdue University Calumet offers a special graduate program leading to a degree of Master of Science (M.S.), Master of Science in Engineering (M.S.E.), or Master of Science in some specific engineering field, e.g., Master of Science in Electrical Engineering (M.S.E.E.) and Master of Science in Mechanical Engineering (M.S.M.E.). The Committee on Continuing Education in Engineering (CCEE) is responsible for the over-all administration of this graduate program.

I. GENERAL INFORMATION

A. Nature and purpose of program

This graduate program in Engineering involves the student in an interdisciplinary education with emphasis on the basic engineering sciences. It is designed to meet the specific needs of engineers employed in industry throughout the state of Indiana and in the greater Calumet area. The program has enough flexibility so that the student may elect courses in several engineering disciplines or the student may elect strong options in a few disciplines. The recommended maximum load for any student who is fully employed is two three-credit courses per semester.

B. General degree information

The interdisciplinary program leads to either the degree of Master of Science or the degree of Master of Science in Engineering. Satisfying specific requirements for a particular engineering field, a student may obtain the degree of Master of Science in that particular engineering field.

Students in the graduate program in Engineering must qualify as regular students and satisfy all the admission requirements of Purdue University. Both thesis and non-thesis programs can be arranged. The non-thesis program requires a minimum of 33 semester hours of course work, and the thesis program requires a minimum of 24 semester hours of course work in addition to a project and thesis.

II. ADMISSION POLICIES AND PROCEDURES

A. Admission as a regular student

A student who wishes to enter a program leading toward the degree of Master of Science, Master of Science in Engineering, or Master of Science in a particular engineering field must apply for admission as a **regular student** and should hold a baccalaureate degree. Under special circumstances students without a baccalaureate degree in engineering will be considered if they have completed the equivalent of studies required for a baccalaureate degree at Purdue.

Students having a Bachelor of Science in Engineering from an ABET/ECPD accredited institution will work toward the Master of Science in Engineering degree. Students with a Bachelor of Science in fields other than engineering or with a Bachelor of Science in Engineering from a non-ABET/ECPD accredited institution will work toward the Master of Science degree, unless granted special permission by the CCEE to work toward a Master of Science in Engineering degree. A student with a Bachelor of Science in a particular engineering field, e.g., Bachelor of Science in Mechanical Engineering, from an ABET/ECPD accredited institution may elect to work toward the degree of Master of Science in that particular field, e.g., Master of Science in Mechanical Engineering.

1. **Unconditional Admission:** The student's undergraduate graduation index (grade point average) must meet or exceed 5.0/6.0 or equivalent as shown on the official transcript.

2. **Conditional Admission:** An applicant with an undergraduate index less than 5.0/6.0 may be admitted as a conditional student. A student granted conditional admission must maintain a minimum index of 5.0 for the twelve credit hours of graduate work following the admission date. In some cases applicants may be advised to complete prerequisite or additional courses to fill deficiencies in their backgrounds. Selection of the additional or prerequisite courses must be approved by the student's advisor. If students fail to meet the specific conditions of admission, they will be dropped from the degree program.

Application packets with all necessary forms for admission as a regular student are available at the Graduate Office of Purdue Calumet. Documents should be submitted

six weeks prior to the beginning of a semester. If documents arrive too late for approval prior to the semester in which the student wishes to commence graduate study, the student may apply for admission as a post-baccalaureate registrant.

Formal admission requires a positive recommendation by the head of the Department of Engineering of Purdue Calumet, the graduate advisor, the chairman of CCEE, and the Dean of the Purdue University Graduate School.

The student and the campus department head will be notified by the Dean of the Graduate School when the application is approved.

B. Admission as a postbaccalaureate registrant

The application form for admission as a postbaccalaureate registrant is available from the Graduate Office of Purdue Calumet. The completed form should be sent to the Graduate Office of Purdue Calumet.

PRECAUTION: A student expecting to work toward a degree in the engineering program should use this admission procedure only to avoid delay in starting the program. The student should submit a separate application form with supporting documents for regular admission during the first session of graduate study.

C. Re-entry procedures

Any graduate student (postbaccalaureate or regular) previously registered who has not registered for one semester or more must file a short form application for re-entry through the Graduate Office. Re-entry as a postbaccalaureate registrant does not guarantee later approval as a degree student. The re-entry application of a regular student will be subject to review and approval by the chairman of the CCEE.

III. GRADUATION REQUIREMENTS

A. Grade Standards: The grade standards in this interdisciplinary graduate engineering program are as follows:

1. A student must have a final graduation grade point index of at least 5.0/6.0 on the approved plan of study in order to receive any of the three types of master's degrees described above.
2. While grades of A, B, or C are acceptable in fulfilling Graduate School requirements on any plan of study, a student's advisory committee may require higher performances than C in certain courses.

B. English proficiency requirement: All degree students must satisfy the English requirement by one of three established methods. The student is cautioned to satisfy the English requirement early in the program. **The plan of study cannot be approved until the English requirement is satisfied.**

C. Advisory Committee: For each of the prospective candidates for a master's degree there shall be an advisory committee consisting of a minimum of three members. The duties of this committee are to assist the student in the preparation of a plan of study and to advise the student during the period of graduate work. If the student elects the thesis option degree program, the committee also advises the student regarding research and the writing of a thesis. Initially all students will consult with a temporary advisor on the campus. Normally, this will be the engineering department head. The student, with the approval of the department head, shall select a major professor. The major professor-student relationship must be a mutually acceptable one. When selected, the major professor will act as the chairman of the student's advisory committee and, where applicable, be in charge of the research. The major professor and the student shall agree upon the related areas and choose at least one additional professor to serve with the major professor to represent the related area or areas. The third advisory committee member will be the graduate advisor at the Lafayette campus. Other members may also

be added to the advisory committee. The advisory committee, as agreed upon by the major professor and the student, with the approval of the engineering department head and the chairman of the CCEE, shall be presented to the Dean of the Graduate School for his approval and final appointment.

D. Plan of study: The plan of study shall be appropriate to meet the needs of the student in the chosen field as determined by an advisory committee. It shall include the specific courses the student is expected to complete and all other requirements of the degree.

In either a thesis or a non-thesis program, a plan of study consists of a group of courses in the student's "Primary Area" and other courses in a "Related Area" or "Related Areas". The courses in the Primary Area should form a coherent group with all courses showing a close relationship. Courses in the Related Area or Areas are less closely related to the Primary Area but still contribute to the program. Normally, courses in Mathematics will be included on the plan of study. Courses may be selected from any academic area. In general, all courses will be graduate level (500 or 600 numbers).

A student may select either a thesis or a non-thesis program. The thesis program requires **a minimum of 24** semester hours of courses plus a research project and thesis. The non-thesis program requires **a minimum of 33** semester hours of courses. Graduate level courses taken by Purdue undergraduate students may be included in a plan of study provided they were declared as excess and were not used to satisfy Bachelor's degree requirements and provided the grades were satisfactory. A tentative plan of study should be drawn up early in the student's program in consultation with the student's advisor or major professor. Courses on the tentative plan of study should be sent to the graduate advisor at the Lafayette campus for review.

The final, formal plan of study should be submitted to the chairman of the CCEE as soon as possible, but not later than the term previous to the term in which the student is to become a candidate for a degree. The formal plan of study is subject to the approval of the advisory committee, the chairman of the CCEE, and the Dean of the Graduate School.

E. Transfer of credit: Transfer of graduate credit from other institutions to Purdue is acceptable provided the courses are graduate level and were not used to complete the requirements of any other degree program. A maximum of twelve (12) hours may be transferred. Two official transcripts must accompany the request for transfer of credit. Each transfer course must have a grade of B or better and must satisfy the course requirements on the plan of study. Requests to transfer graduate credit should be first discussed with the student's advisor, then prepared in writing, and sent to the chairman of the CCEE for his approval.

IV. MISCELLANEOUS INFORMATION

A. Time limit on re-entry: If a student is inactive for five years, a new plan of study must be approved. Ordinarily, courses taken previously cannot be used on the new plan of study, but, where warranted, some of the previous courses may be approved.

B. Credit by examination: In special cases it may be possible for the graduate student to obtain credit by taking a comprehensive examination over the subject matter included in a specific graduate course.

C. Graduate Courses, Primary and Related Areas: For a detailed description of these courses see the engineering departmental sections of the Graduate School Bulletin.

PRIMARY AREA

Department and Course Number		Course Title
A&AE	543	Continuum Mechanics I (ME 507)
A&AE	544	Continuum Mechanics II (ME 508)
A&AE	547	Experimental Stress Analysis
CE	511	History of Urban Planning and Urban Design
CE	512	Introduction to Comprehensive Urban Planning
CE	570	Advanced Structural Mechanics
CE	574	Introduction to Structural Reliability
CE	577	Theory of Elasticity, Plates and Shells
CE	579	Structural Stability
CE	675	Finite Element Analysis
CE	677	Theory and Design of Shells
EE	518	Introduction to Automatic Control Systems
EE	519	Control Theory II
EE	525	Analysis of Electromechanical Systems I
EE	532	Computational Methods for Power System Analysis
EE	554	Electronic Instrumentation and Control Circuits
EE	595	Selected Topics in Electrical Engineering
EE	600	Random Variables and Signals
EE	602	Lumped System Theory
EE	604	Electromagnetic Field Theory
EE	606	Solid State and Magnetic Devices
EE	608	Foundations of Computer Engineering
EE	654	Device Related Semiconductor Phenomena
EE	672	Linear Passive Network Theory
EE	676	Active and Digital Filters
EE	680	Introduction to Modern Control Theory
EE	685	Digital Process Control and Mathematical Modeling of Industrial Systems
IE	530	Quality Control
IE	532	Reliability
IE	535	Linear Programming
IE	536	Stochastic Models in Operations Research
IE	545	Engineering Economic Analysis
IE	546	Economic Decisions in Engineering
IE	558	Safety Engineering
IE	579	Advanced Production Control
IE	590	Topics in Industrial Engineering
ME	500	Thermodynamics
ME	505	Heat and Mass Transfer
ME	509	Intermediate Fluid Mechanics
ME	510	Gas Dynamics
ME	513	Engineering Acoustics
ME	527	Solar Energy Systems
ME	528	Air Pollution
ME	530	Direct Energy Conversion
ME	560	Kinematics
ME	563	Mechanical Vibrations
ME	568	Systems Optimization Techniques I
ME	569	Mechanical Behavior of Materials
ME	571	Lubrication and Fluid Cushion Systems Design

ME	580	Nonlinear Engineering Systems
ME	587	Engineering Optics
ME	597	Selected Topics in Mechanical Engineering
MSE	575	Transport Phenomena in Solids
MSE	576	Corrosion
MSE	597	Selected Topics in Materials Engineering
NUCL	501	Nuclear Engineering Principles
NUCL	502	Nuclear Engineering Systems

GRADUATE PROGRAMS IN ENGLISH

Purdue University Calumet offers two Master of Arts degrees in English which are available in their entirety at Purdue Calumet. These are in addition to the Master of Science Degree in Education with teaching area of English.

Master of Arts in English (Option 1)

The first option Master of Arts degree is available for students planning to continue toward the Ph.D. degree, for prospective high school and college English teachers, and for those planning careers in which a Master's degree in English would be useful, such as editing and writing. Both thesis and nonthesis options are available.

To qualify for this option, the candidate must complete 30 hours of course work under the nonthesis option, or 21 hours under the thesis option, and pass a final examination and a foreign language examination. ENGL 506 and 601 and at least one graduate seminar are required of all students of this option.

Master of Arts in English (Option 2)

The second option for the Master of Arts degree is designed for those who prefer to do additional course work in English instead of fulfilling a foreign language requirement. This option includes course work in English and American literature, linguistics, literary criticism, and a seminar in the English language arts.

To qualify for the second option, the candidate must complete 33 semester hours of course work (there is no thesis option), and pass a final examination (there is no foreign language examination). ENGL 601 and 691 are required in addition to courses distributed among various areas of English and American literature and linguistics. In special cases, dual-level courses taken as an undergraduate student and courses from other disciplines may be applied to some of these requirements.

ADMISSION TO GRADUATE STUDY IN ENGLISH

Students desiring admission to a graduate program of study must hold a baccalaureate degree from a college or university of recognized standing and file an application for admission with the Graduate Office at Purdue Calumet. Candidates are expected to have completed the equivalent of an undergraduate major in English or a minor in English. The Graduate Record Examination (Aptitude test and Advanced Test in Literature in English) is required. Candidates lacking some of the normal prerequisites but otherwise well qualified may be admitted on the condition that they take certain prerequisite courses.

Normally a student's plan of study may contain no more than six semester hours of graduate credit from another institution. However, the student may appeal to the Graduate Committee of the Department of English for approval of more than six hours of transferred credit.

Applicants may request an appointment with a graduate English advisor by visiting or phoning the Department of English and Philosophy, located in the Classroom-Office Building, 0-232, or the Graduate School Office, in 0-352 of the same building. The departmental phone number is (219) 844-0520, Ext. 259.

GRADUATE PROGRAM IN HISTORY

The Department of History at Purdue Calumet offers graduate work in American and European history leading to the master of arts degree. Graduate courses are offered in both day and evening hours to accommodate full and part-time students.

Requirements for Admission

Candidates are expected to have completed the equivalency of an undergraduate major in history or a strong minor in history as part of a liberal arts background. A course dealing with historical methodology must be completed by the student either as an undergraduate or as a prerequisite for the M.A.

The applicant must be a graduate of an accredited college or university, complete the Aptitude Section of the Graduate Record Examination, and submit transcripts of previous academic work and letters of recommendation.

Requirements for the Degree

Purdue Calumet offers a nonthesis master of arts program which allows selection of a major area and a related area of at least six semester hours. Related areas need not be in history. Purdue Calumet offers classes to meet this requirement in education, political science, English, sociology, or other humanities fields. Altogether, thirty-three semester hours of graduate level work, of which nine hours must be graduate seminars, are required for the M.A. Completion of the course work must be followed by written and oral comprehensive examinations.

All course work and comprehensive examinations will be taken at Purdue Calumet. Normally a student may transfer no more than six semester hours of graduate credit from another school.

There is no foreign language requirement for M.A. candidates, but basic proficiency in English must be demonstrated by credit or test.

For specific information and application forms contact either the Department of History and Political Science or the Graduate School Office. Completed applications should be given to Prof. Saul Lerner, head, Department of History and Political Science.

Professional Opportunities

The M.A. program prepares students for teaching positions, for research careers in a number of fields, and for further graduate work leading to the Ph.D. degree. The individual student's program is developed with the emphasis that will best equip the student for a chosen field of work.

Graduate Courses

The following history courses are available at Purdue Calumet, many on a one- or two-year cycle. Classes are offered on both day and night schedules to accommodate full- or part-time students:

Course No. **Course Title**

HIST 403 — Europe in the Reformation
HIST 461 — The Revolutionary Era, 1763-1800
HIST 472 — Mexico

HIST 493 — Interdisciplinary Undergraduate Seminar
HIST 494 — Science and Technology in American Civilization
HIST 496 — History and the Life Sciences
HIST 510 — Age of Absolute Monarchy, 1600-1689
HIST 511 — England Under the Tudors
HIST 512 — England Under the Stuarts
HIST 513 — Modern Europe, 1789-1850
HIST 514 — History of Western Thought I
HIST 515 — History of Western Thought II
HIST 521 — Problems in History of Great Britain — 19th Century
HIST 522 — Problems in History of Great Britain — 20th Century
HIST 525 — Problems in 20th Century German History
HIST 528 — European International Relations and Power Politics, 1648-1815
HIST 529 — European International Relations and Power Politics, Since 1815
HIST 535 — Modern Europe, 1850-1914
HIST 538 — Modern Russia
HIST 552 — Modern Europe, Since 1914
HIST 553 — Colonial America, 1600-1776
HIST 554 — Era of Sectionalism, 1820-1865
HIST 555 — Emergence of Modern America, 1865-1916
HIST 562 — Environmentalism in United States History
HIST 564 — Modern America, 1917-Present
HIST 569 — American South
HIST 570 — United States-Latin American Relations
HIST 575 — American Frontier
HIST 577 — Contemporary Latin America
HIST 578 — Colonial Latin America
HIST 579 — National Latin America
HIST 582 — Art of History
HIST 584 — Social History of United States
HIST 585 — American Labor History
HIST 586 — United States Foreign Affairs to 1900
HIST 587 — 20th Century United States Foreign Affairs
HIST 589 — History of Religion in America
HIST 590A — Modern Germany
HIST 590 — Directed Reading in History
HIST 592 — Early American Intellectual History
HIST 593 — 20th Century American Intellectual History
HIST 596 — The American City
HIST 597 — Problems in 20th Century Black America
HIST 599 — Teaching Black History
HIST 601 — Reading Seminar in European History
HIST 603 — Seminar in European History, Renaissance and Reformation
HIST 605 — Seminar in European History, The Ages of Absolutism, Enlightenment, and Reason
HIST 607 — Seminar in European History, French Revolution and 19th Century
HIST 609 — Seminar in European History in the 20th Century
HIST 611 — Seminar in the Political and Constitutional History of Europe
HIST 651 — Reading Seminar in American History
HIST 653 — Seminar in American History, Colonial History and the American Revolution
HIST 655 — Seminar in American History, National Period to 1850
HIST 657 — Seminar in American History, 1850 to World War I

HIST 659 — Seminar in American History, World War I to Present
HIST 661 — Seminar in United States Foreign Affairs and National Security Policy

GRADUATE PROGRAM IN MANAGEMENT

The Department of Management at Purdue Calumet offers graduate work leading to a Master of Science degree with a major in Management. Graduate courses are offered in the evening hours so that the degree can be completed exclusively at night.

Objectives:

The objective of the program is to help students prepare for positions of major management responsibility. The program is designed to accommodate those with undergraduate training in engineering, mathematics, science, humanities or business.

The curriculum provides an opportunity for the student to gain an understanding and develop some useful managerial skills in each of the major functional areas of management. A major purpose of each course is to help each student acquire increased managerial competence and breadth in administrative decision-making.

Admission requirements

Candidates are expected to have a bachelor's degree from an accredited college or university with a minimum cumulative grade point average of 5.0. In addition, all applicants must write the Graduate Management Admission Test. Students whose native language is not English must also take the TOEFL examination.

In evaluating applications, the school is concerned primarily with an individual's capacity for management responsibility. Demonstration of intellectual capacity is a prime consideration; however, close attention also is given to indications of personal development which may have a bearing on the individual's prospects for career success. The evaluation is based upon a detailed review of the written application, academic transcripts, letters of evaluation from former instructors and others who are qualified to evaluate the applicant's capacity for graduate study, and the score in the Graduate Management Admission Test.

Requirements for a degree

A student must complete 48 hours of course work as outlined. There is no thesis requirement. Students who feel that their circumstances require deviations from the outlined program should discuss their proposed plan of study with their graduate advisor. It is anticipated that most students will satisfy the calculus requirement by prior undergraduate work. At least 30 hours must be taken in residence at Purdue and a B (5.0/6.0) average must be maintained in order to qualify for the degree. There is no foreign language requirement, but basic English proficiency must be demonstrated by previous college credit or by examination.

The Master of Science in Management program consists of the following:

Core Requirements:

Differential and Integral Calculus		6 Hours
Economic Theory	ECON 513	3 Hours
Financial Control I	MGMT 600	3 Hours
Financial Control II	MGMT 601	3 Hours
Financial Management II	MGMT 611	3 Hours
Marketing Plans & Decision Making	MGMT 620	3 Hours
Legal & Social Foundations Mgmt.	MGMT 630	3 Hours
Personnel Function	MGMT 631	3 Hours

Strategic Mgmt.	MGMT 650	3 Hours
Operations Mgmt.	MGMT 660	3 Hours
Quantitative Methods I	MGMT 670	3 Hours
Quantitative Methods II	MGMT 671	3 Hours

Electives:

Public Finance and Taxation	ECON 522	
State & Local Finance	ECON 523	
Government & the Economy	ECON 525	
Money & Finance	ECON 530	
International Trade Theory	ECON 534	
Current World Economic Problems	ECON 535	
Economics of Health	ECON 560	
U.S. & World Ec. in Recent Times	ECON 585	
Accounting Problems	MGMT 503	
Tax Accounting	MGMT 504	
Mgmt. Accounting II	MGMT 505	
Auditing	MGMT 506	
Financial Inst. & Markets	MGMT 512	
Investment Management	MGMT 516	
Labor Law	MGMT 553	
Small Business Mgmt.	MGMT 583	
New Enterprises	MGMT 584	
Accounting Theory	MGMT 590 A	
Collective Bargaining	MGMT 632	
Government & Industrial Relations	MGMT 636	
Operations Mgmt II	MGMT 661	9 Hours
Total semester hours		48 Hours

Master of Arts in Teaching Economics

The Department of Management also offers a program leading to the Master of Arts in Teaching Economics. Designed for elementary and secondary school teachers who wish to increase their knowledge of economics, this program is designed to:

Enhance a teacher's effectiveness in the classroom by:

— developing skills in integrating economic theory and policy
— providing experience in using innovative pedagogical techniques in economics

Prepare the teacher for a leadership role in curriculum supervision by:

— familiarization with the curricular materials in economics
— introduction to the research literature in economics education

Develop the skills to coordinate and participate in economic education workshops by:

— training propsective teachers
— administering workshops

GRADUATE PROGRAMS IN MATHEMATICS

Three programs are offered at Purdue Calumet by the Department of Mathematical Sciences. Two of these programs, Master of Science (Option for Teachers) and Master of Arts in Teaching, are designed primarily for the secondary school (Grades 7-12) mathematics teacher. The third program, Master of Science in the Application of Mathematics, is intended for those people who want to continue their professional development through a program in applied mathematics.

Besides satisfying the general regulations of the graduate school, the student must complete the following requirements.

A. Master of Science (Option for Teachers) and Master of Arts in Teaching

1. **Plan of Study.** Students preparing for candidacy should submit an acceptable plan of study to the advisory committee before the end of the second semester of graduate study. In any case, a plan of study must be approved by the department and the Graduate School before the student registers for the semester in which the degree is expected.
2. **Examination.** Normally a student who has completed an approved plan of study, with all grades of A or B with the possible exception of 2 C's, is not required to take a comprehensive examination. However, at the discretion of the student's advisory committee, a student may be required to pass comprehensive written and/or oral examinations. These programs require a minimum of 33 semester hours of graduate credits in course work.

Master of Science (Option for Teachers). The plan of study should include four courses in algebra and analysis selected from MA 525, 540, 541, 553, and 554; general topology (MA 571); probability and statistics (STAT 516); one course in geometry selected from MA 561 and 563; one additional course in mathematics, computer science, or statistics to be selected with the approval of the advisory committee.

Master of Arts in Teaching. This program is open primarily to those secondary school teachers whose mathematics background is not sufficient to permit candidacy for the M.S. (Option for Teachers) degree. The M.A.T. is not intended to be preparatory for a Ph.D. degree in mathematics or mathematics education.

A plan of study will normally include six semester hours in algebra, six semester hours in geometry, six semester hours in analysis, and one course in mathematics, computer science, or statistics to be selected with the approval of the advisory committee. Courses which meet these requirements include MA 547, 548, 550, 551, 561, and 563. A student who has completed a course equivalent to any of these as an undergraduate must substitute a more advanced course unless it is determined by the advisory committee not to be feasible. The student must complete 12 additional hours. These may be in related areas.

B. Master of Science in the Application of Mathematics

1. **Degree Requirements:** A mimimum of 30 semester hours are required. The course work should be completed within a six year period. All grades must be A or B with the possible exception of 2 C's. A plan of study should be submitted to the student's Advisory Committee before the end of nine semester hours or at the end of the first semester. In any case, a plan of study must be approved by the department and the Graduate School before the student registers for the semester in which the degree is expected.
2. **Sample Curriculum:** A minimum of 21 semester hours must be taken in the Mathematical Science. It is recommended that nine semester hours be taken in a specialty area correlated with the student's career goals. Four options are available to the student. The following are the plans of study for each option.

Students presenting evidence of successful completion of equivalent courses can substitute other courses with the approval of their committee. Each plan of study must be individually approved by the Advisory Committee. The following four courses must be taken by all students:

Complex Analysis	MA 525
Real Analysis:	MA 534
Linear Algebra:	MA 554
Statistics:	STAT 528

a. Statistics Option:
Foundations and Methods of Statistics: STAT 529
At least one course chosen from: STAT 512, STAT 513, STAT 532
Three chosen from: CS 514, CS 515, MA 521, MA 526, MGMT 660, MGMT 661, MA 580
Remaining course to be chosen in consultation with the Advisory Committee.

b. Operations Research Option:
Introduction to Optimization Problems: MA 521
Foundations and Methods of Statistics: STAT 529
Numerical Analysis: CS 514
Two chosen from: MGMT 660, MGMT 661, MGMT 690, CS 520, IE 535, IE 536, MA 580
Remaining course to be chosen in consultation with the Advisory Committee.

c. Numerical Analysis Option:
Introduction to Partial Differential Equations: MA 523
Numerical Analysis: CS 514
Introduction to Optimization Problems: MA 521
Numerical Solution of Differential Equations: CS 515, CS 615
One chosen from: MA 522, MA 617, IE 536, CS 520, MA 580

d. Mathematical Methods and Applications Options:
Introduction to Partial Differential Equations: MA 523
Introduction to Optimization Problems: MA 521
Numerical Solutions of Partial Differential Equations: CS 615
Two chosen from: MA 627, STAT 532, ME 505, ME 509, ME 510, MA 580, MA 526
Remaining course to be chosen in consultation with the Advisory Committee.

Course Numbering and Abbreviations

Courses numbered 1-499 are primarily for undergraduate students. Courses numbered 500-599 are for undergraduates (usually juniors and seniors) and graduate students. Courses numbered 600 and above are for graduate students.

For each course the first part of the description should be interpreted as follows: first, the official number of the course; second, its special title; and third, the number of class, laboratory, and credit hours.

ABBREVIATIONS

A&AE — Aeronautical and Astronautical Engineering
A&D — Art and Design
AGEC — Agricultural Economics
AGR — Agriculture
AGRY — Agronomy
ASNC — Animal Science
ANTH — Anthropology
ART— Architectural Technology
AUS — Audiology and Speech Sciences
BHS — Behavioral Sciences
BIOL — Biological Science
CDFS — Child Development and Family Studies
CE — Civil Engineering
CET — Civil Engineering Technology
CFS — Consumer and Family Sciences
CHM — Chemistry
CHT — Chemical Technology
CIS — Computer Information Services
CLCS — Classics
CNT — Construction Technology
COM — Communication
CS — Computer Sciences
CSR — Consumer Science and Retailing
ECON — Economics
ED — Education
EE — Electrical Engineering
EET — Electrical Engineering Technology
ENGL — English
ENGR — Engineering
FLL — Foreign Languages and Literatures
F&N — Foods and Nutrition
FOR — Forestry and Conservation
FR — French
GEOS — Geosciences
GER — German
GNS — General Studies
GS — General Studies (HESS)
H&S — Health and Safety
HEET — Electrical Engineering Technology
HIST — History
HORT — Horticulture
HPER — Health, Physical Education and Recreation
IE — Industrial Engineering
IED — Industrial Education
IET — Industrial Engineering Technology
MA — Mathematics
ME — Mechanical Engineering
MET — Mechanical Engineering Technology
MGMT — Management
MSE — Materials Engineering
MUS — Music History and Theory
NUCL — Nuclear Engineering
NUR — Nursing
ORGB — Organizational Behavior
PCTX — Pharmacology
PE — Physical Education
PHIL — Philosophy
PHYS — Physics
POL — Political Science
PSY — Psychology
RHI — Restaurant, Hotel and Institutional Management
SCI — Science
SOC — Sociology
SPAN — Spanish
SPV — Supervision
STAT — Statistics
THTR — Theater

School of Engineering, Management, and Technology

Roy W. Reach, Dean

MISSION AND ORGANIZATION

The mission of the School of Engineering, Management, and Technology is six-fold:

1. To provide educational programs and experiences for students whose abilities and interests are directed toward professional careers in engineering, management and technology.
2. To provide educational programs which will prepare students in the application of basic principles to the solution of problems which confront society.
3. To fulfill the broader goals of education within these programs.
4. To provide opportunities through which members of the community may further their professional education.
5. To provide the environment which will encourage the university staff to grow professionally, through research, additional study, and other scholarly activities, and to respond to the changing needs of society and the community.
6. To serve community needs in Northwest Indiana within the available resources of the School of Engineering, Management, and Technology.

The scope of this mission includes the spectrum from state of the art technologies to engineering sciences. The School offers a wide range of programs and courses both on the undergraduate and graduate level which will prepare students for a variety of career opportunities. For a description of graduate programs available see the section of this catalog titled "Graduate Study."

The problems facing society today are vast. However, new discoveries and applications are occurring at a rate unequaled in the history of mankind. Graduates of the School of Engineering, Management, and Technology will ultimately deal with and contribute to the solution of today's and tomorrow's problems. A few of the areas of present concern include population growth, pollution, energy, food production, economics, managment, transportation, and education.

The School is organized around six departments as follows:

Department of Construction Technology
Department of Electrical Engineering Technology
Department of Engineering
Department of Information Systems and Computer Programming
Department of Management
Department of Manufacturing Engineering Technologies and Supervision

The programs of study are discussed in detail in the following departmental sections of this catalog. The degrees granted by the School of Engineering, Management, and Technology include the following:

Graduate Degrees (See Section on Graduate Study)
Associate of Applied Science
Associate in Management
Bachelor of Science

Bachelor of Science in Industrial Education
Bachelor of Science in Engineering

In addition, a certificate is awarded for:
Professional Supervision

Students can readily transfer between the various campuses of Purdue University. Plans of study can be arranged so that a student can complete a portion of his work at Purdue Calumet and transfer to another Purdue Campus for the completion of his degree requirements.

COOPERATIVE EDUCATION PROGRAMS

The School offers some cooperative education programs. These programs constitute a well defined plan of work experience and formal study. Students interested in this program are encouraged to discuss these opportunities with the School's Co-op Coordinator or their academic advisor.

PASS/NOT PASS OPTION

In order to provide students with the opportunity to broaden their educational foundations with minimal concern for grades earned, an alternative grading system, the pass/not pass option, has been established.

1. The option is open to all students in the University subject to the regulations of the school in which the student is enrolled. In particular, the School of Engineering, Management, and Technology has specified under what conditions a course that is passed under this option may be used to satisfy the graduation requirements of its various programs.
2. Subject to the specific program regulations below, a student may elect this option in any course which does not already appear on his academic record and in which he is otherwise eligible to enroll for credit with letter grade. A student may not elect this option for more than 20 percent of the total credit hours required for his graduation.
3. The registrar's class rosters will indicate which students have elected this option.
4. A student who is enrolled in a course under this option has the same obligation as those who are enrolled in the course for credit with letter grade. When the instructor reports final grades in the course, he will report that any such student who would have earned a grade of A, B, or C has passed the course, and that any other such student has not passed. The registrar will make an appropriate notation on the student's academic record in place of a letter grade but will not use the course in computing grade indices.

In addition to these general regulations, the School of Engineering, Management, and Technology has its own limitations on the types and uses of courses elected under this option in its various programs. The following rules are currently applicable:

Construction Technology, Electrical Engineering Technology, Information Systems and Computer Programming, and Manufacturing Engineering Technologies and Supervision.

1. No student will be permitted to choose the pass/not pass option until the student's advisor is in agreement that this appears to be a desirable course for the student to pursue in this particular situation.

Engineering

1. In engineering the pass/not pass option shall not be available for required courses in the freshman year.

2. This option shall not be available to students on probation.
3. This option shall be available for a maximum of two courses in any one semester, one course during a summer session.
4. A student receiving the grade of "pass" in a course taken under the pass/not pass option may not take the same course for a letter grade.

Management

1. Students in Management programs may not elect the pass/not pass option for more than 15 total credit hours. Students may select courses under the pass/not pass option in the elective area.
2. No case course may be selected under this option.
3. Students who are on academic probation must complete at least 12 hours of letter grade course work for that semester. Students who are placed on academic probation for the second consecutive semester may not elect the pass/not pass option until they are removed from the probationary status.
4. A course in which a pass grade was received may not be repeated with the letter grade option. If any not pass grades are received, the student can elect to repeat any or all of these courses for letter grades.
5. Any student who elects the option should be classified four or higher. Students classified as three's may select the option if the circumstances warrant such action.
6. The student will be discouraged from electing the pass/not pass option for more than one course per semester.
7. The grading system that is selected for each course cannot be changed after the first week of the semester. Before that date, however, the student can go through the drop/add procedure and change the grading option.

CIVIL ENGINEERING TECHNOLOGY — See Department of Construction Technology

COMPUTER PROGRAMMING — See Department of Information Systems and Computer Programming

DEPARTMENT OF CONSTRUCTION TECHNOLOGY

Ralph E. Bennett III, Head

FACULTY: R.E. Bennett, E.A. Dudek, W.F. Glowicki, C.J. McAllister, B.M. Meeker, N.G. Scarlatis, S. Truchan, Jr.

The Department of Construction Technology offers two 2-year Associate in Applied Science (A.A.S.) degrees, one in Architectural Technology, and another in Civil Engineering Technology. Upon completion of either of these degrees, the student may choose to complete the third and fourth years for the Bachelor of Science degree in Construction Technology.

ASSOCIATE IN APPLIED SCIENCE DEGREE (ARCHITECTURAL TECHNOLOGY)

This curriculum is designed to prepare students for technological employment with contractors, building materials suppliers, architects, civil engineers, and related governmental agencies.

Graduates of this two year Program are prepared to accept positions as estimators, expeditors, planning technicians, field inspectors, architectural detailers, architectural draftsmen, and sales representatives. With experience, after completing this program of

study, graduates are now holding positions as field engineers, technical engineers, junior structural engineers, engineering assistants, shop superintendents, and real estate brokers. This field of specialization is well designed to help the student who is interested in going into the construction business for himself. *Graduates may also continue their education by pursuing a Bachelor of Science degree in construction technology.*

FRESHMAN YEAR

First Semester	Second Semester
(2) ART 116 (Constr. Drafting)	(3) ART 150 (Arch Constr. I)
(2) ART 120 (Freehand Drawing I)	(2) ART 220 (Freehand Drawing II)
(2) ART 172 (Systems of Construction)	(3) CET 160 (Statics)
(1) CNT 101 (Constr. Lectures)	(3) CIS 200 (Computer Prog. Fund.)
(3) CET 104 (Elem. Surveying)	(3) ENGL 220 (Tech. Report Writing)
(3) ENGL 104 (English Comp.)	(3) MA 148 (Alg. & Trig. for Tech.)
(3) MA 147 (Alg. & Trig. for Tech.)	
—	—
(16)	(17)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) ART 222 (Arch. Contr. II)	(2) ART 276 (Spec. & Contract Documents)
(3) ART 284 (Mech. Equip. of Bldgs.)	(3) CET 266 (Matls. Testing)
(3) CET 260 (Strength of Matls.)	(3) CET 280 (Structural Calculations)
(3) COM 115 (Fund. of Public Speaking)	(3) CNT 280 (Quantity Survey and Estimating)
(3) MA 221 (Calculus for Tech. I)	(4) PHYS 219 (General Physics)
(4) PHYS 218 (General Physics)	(3) Social Science Elective
—	—
(19)	(18)

ASSOCIATE IN APPLIED SCIENCE DEGREE (CIVIL ENGINEERING TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology

This program is designed to prepare students for employment with land surveyors, highway departments, contractors, city engineering offices, railroads, and engineering consultants, as well as in other specializations of civil engineering technology.

Graduates of this two year program accept positions as technicians in the offices of contractors, city engineers, and professional engineers; as topographers, structural draftsmen, and steel and concrete laboratory technicians; and as instrument men with land surveys, property surveys, and highway surveys. With additional experience students may acquire positions as supervisors, or chiefs of parties, in a variety of work associated with civil engineering.

Graduates may also continue their education by pursuing a Bachelor of Science degree in construction technology.

FRESHMAN YEAR

First Semester	Second Semester
(2) ART 116 (Constr. Drafting)	(3) CIS 200 (Computer Prog. Fund.)
(2) ART 120 (Freehand Drawing I)	(3) CET 160 (Statics)
(2) ART 172 (Systems of Construction)	(3) ART 150 (Arch. Constr. I)
(1) CNT 101 (Constr. Lectures)	(3) MA 148 (Alg. & Trig. for Tech.)
(3) CET 104 (Elem. Surveying)	(3) ENGL 220 (Tech. Report Writing)
(3) ENGL 104 (English Comp.)	(3) Social Science Elective
(3) MA 147 (Alg. & Trig. for Tech.)	
(16)	(18)

SOPHOMORE YEAR

Third Semester	
(2) CET 208 (Route Surv. & Design)	(2) ART 276 (Spec. & Contract Documents)
(3) CET 253 (Hydraulics & Drainage)	(3) CET 209 (Land Surv. & Sub. Div.)
(3) CET 260 (Strength of Matls.)	(3) CET 280 (Structural Calculations)
(3) COM 115 (Fund. of Public Speaking)	(3) CET 266 (Matls. Testing)
(3) MA 221 (Calculus for Tech. I)	(3) CNT 280 (Quantity Survey and Estimating)
(4) PHYS 218 (General Physics)	(4) PHYS 219 (General Physics)
(18)	(18)

BACHELOR OF SCIENCE DEGREE (CONSTRUCTION TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

This baccalaureate program is open to students with an Associate in Applied Science degree in architectural technology, civil engineering technology, or the equivalent. It is an extension of the associate degree program with emphasis on the principles and practices of construction, further development of the technical courses of the associate degree program, an introduction to the principles of business and management, and additional training in written and verbal communications.

Graduates of the program find employment with contractors, architects, consulting engineers, building product companies, or governmental organizations. Experienced graduates may be employed in a wide variety of occupational areas such as contracting, detailing, drafting, estimating, inspecting, merchandising, supervising, and testing. This curriculum is not designed to prepare students for registration as professional architects or engineers.

JUNIOR YEAR

Fifth Semester	Sixth Semester
(4) CNT 441 (Constr. Operations)	(3) CET 382 (Steel Construction)
(3) CET 386 (Reinf. Concrete Constr.)	(3) CNT 344 (Constr. Inspection)
(3) CET 431 (Prop. & Behav. of Soils)	(3) SPV 331 (Occup. Safety & Health)
(3) COM 315 (Comm. of Tech. Info.)	(3) IET 250 (Fund. of Prod. Cost Anal.)
(3) Humanities Elective	(3) Technical Elective
	(3) Construction Elective
(16)	(18)

Summer (1) CNT 390 (Constr. Experience)

SENIOR YEAR

Seventh Semester	Eighth Semester
(3) ART 424 (Building Design Project)	(3) CNT 445 (Constr. Management)
(2) CNT 340 (Constr. Scheduling)	(3) COM 415 (Discuss of Tech Probl.)
(3) MGMT 430 (Labor Relations)	(3) MGMT 455 (Legal Backg'd in Bus)
(3) ENGL 422 (Indust. Writing)	(3) Construction Elective
(3) Technical Elective	(3) Humanities Elective
(3) Construction Elective	
(17)	(15)

CONSTRUCTION ELECTIVES: CET 108; CET 208; CET 209; CET 253; CET 366; CET 368; CET 384; CET 408; CET 409; CET 432; ART 284; ART 285; ART 360; ART 362

TECHNICAL ELECTIVES: Courses in the Schools of EMT and S & N that have been approved by this Department.

SOCIAL SCIENCE ELECTIVES: ECON 210; PSY 120; PHIL 110; SOC 100

ARCHITECTURAL TECHNOLOGY

ART 116. CONSTRUCTION DRAFTING. Lab. 6, cr. 2.

Introduction to drafting fundamentals with emphasis on architectural and civil engineering topics. Use of instruments, lettering, orthographic projection, auxiliary views, intersections, perspective, and working drawings.

ART 118. ARCHITECTURAL PROJECTIONS. Lab. 6, cr. 2.

Introduction to projection, intersections, shading and shadows, and perspective drawing.

ART 120. FREEHAND DRAWING I. Lab. 6, cr. 2.

Development of freehand drawing techniques, using black and white media, with an emphasis on basic drawing principles (perspective, light and shade, composition) and the study of architectural subjects.

ART 150. ARCHITECTURAL CONSTRUCTION I. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 116 or ENGR 114.

A study of wood frame construction through a semester project requiring planning, preliminary and working drawings, and a model of the framing system. Field trips may be included.

ART 162. BUILDING MATERIALS AND METHODS. Class 1, Lab. 3, cr. 2.

Properties and use of various building materials in modern construction, and an introduction to the skills and methods related to their erection.

ART 164. BUILDING MATERIALS. Class 2, cr. 2.

Properties and use of materials as found in building construction.

ART 172. SYSTEMS OF CONSTRUCTION. Class 2, cr. 2.

A very brief survey of the organization of the construction industry, and introduction to various building components and systems with emphasis on a non-mathematical study of structural systems.

ART 204. BUILDING REGULATIONS. Class 2, cr. 2.

Building codes, ordinances, and regulations, with emphasis on those for structures in Indiana.

ART 210. HISTORY OF ARCHITECTURE I. Class 3, cr. 3.

Survey of styles and influences of cultures which led to the development of architecture from the earliest times to the present day.

ART 220. FREEHAND DRAWING II. Lab. 6, cr. 2.

Continuation of ART 120. The study of color theory and the use of color techniques in watercolor, especially of architectural subjects.

ART 222. ARCHITECTURAL CONSTRUCTION II. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 150.

Preparation of preliminary and working drawings for an intermediate-sized commercial or institutional building.

ART 224. ARCHITECTURAL CONSTRUCTION III. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: Art 222.

Continuation of ART 222 with emphasis on larger and more complex structures.

ART 276. SPECIFICATIONS AND CONTRACT DOCUMENTS. Class 2, cr. 2.

Preparation of general conditions and major phases of building construction specifications, study agreements, contracts, liens, and bonds.

ART 284. MECHANICAL EQUIPMENT OF BUILDINGS. Class 3, cr. 3.

A study of plumbing, heating and air-conditioning for residential and commercial buildings. Water supply and drainage systems, heat loss and heat gain, heating systems, and air-conditioning systems.

ART 285. ELECTRICITY FOR BUILDINGS. Class 2, cr. 2.

A survey of electrical and lighting requirements for residential and commercial buildings. Lighting fundamentals and design, electric circuits, power requirements, and wiring layout. Field trips to generating stations, buildings under construction, and the General Electric Institute, Nela Park, Ohio are part of the course.

ART 299. ARCHITECTURAL ENGINEERING TECHNOLOGY. Cr. 1-4.

Hours and subject matter to be arranged with staff. Course may be repeated up to 9 hours.

ART 310. HISTORY OF ARCHITECTURE II. Class 3, cr. 3. Prerequisite: ART 210.

A survey of architectural developments of the nineteenth and twentieth centuries.

ART 341. ARCHITECTURAL DESIGN I. Class 1, Lab. 5, cr. 3. Prerequisite: ART 224.

Planning, development, architectural delineation of small structures with pencil, charcoal, and water colors.

ART 342. ARCHITECTURAL DESIGN II. Class 1, Lab. 5, cr. 3. Prerequisite: ART 341.

Continuation of ART 341 with emphasis on larger and more complex structures.

ART 360. COMMUNITY PLANNING I. Class 2, Lab. 3, cr. 3.

A study of planning methods, legislation, and agencies. Emphasis on collection of data about

an existing community and the preparation of land-use maps from that data.

ART 362. COMMUNITY PLANNING II. Class 1, Lab. 6, cr. 3. Prerequisite: ART 360.

Application of planning methods to the development of a new community or the redevelopment of an existing community.

ART 424. BUILDING DESIGN PROJECT. Lab. 9, cr. 3.

Design and preparation of a set of working drawings for a moderate size building. Emphasis will be primarily on architectural and structural drawings, building codes, and drafting techniques. Secondary emphasis will be placed on mechanical, electrical, and plumbing systems as they apply to the project.

ART 460. REAL ESTATE. Class 3, cr. 3.

A study of the legal aspects and practices of the real estate business, including appraising, finance, property management, and land development.

ART 476. SPECIFICATIONS. Class 3, cr. 3.

Expansion of the general principles of construction documents covered in ART 276. Detailed study of purpose and intent of specifications. Preparation of various sections or specifications for specific jobs, including: development of the general conditions, adaptation of selected provisions from standard specifications, and delineation of special supplemental conditions.

ART 490. SENIOR PROJECT. Cr. 1-6.

Final project aimed at combining the skills and knowledge gained from the various areas of studies. The student will be expected to report graphically, orally, and in written form on a final project approved by the advisor. Presentation will be made to a representative board of the faculty determined by the advisor.

ART 499. ARCHITECTURAL TECHNOLOGY. Cr. 1-4.

Hours, subject matter and credit to be arranged with staff. Course may be repeated for credit up to 9 hours.

CIVIL ENGINEERING TECHNOLOGY

CET 100. TECHNICAL COMPUTATIONS. Class 3, Cr. 3.

A study of elements from algebra and trigonometry appropriate to surveying and construction, and of related computational methods including: logarithms, calculator and computer.

CET 104. ELEMENTARY SURVEYING. Class 2, Lab. 3, cr. 3. Prerequisite or corequisite: MA 147 or equivalent.

Measurement of distances, directions and angles, using the tape, level, compass and transit. Computation of areas and traverses, lines and grades.

CET 108. ROUTE SURVEYING AND DESIGN. Class 1, Lab. 6, cr. 3. Prerequisite: CET 104.

Preliminary and construction surveys for route location. Calculation and field work for simple and easement curves, superlevation of curves, grade lines, and slope stakes. Preparation of plans, profiles, and cross-sections from field survey data. Earth-work estimates.

CET 160. STATICS. Class 3, cr. 3. Corequisite: MA 148 or equivalent.

Study of force action on bodies at rest. Coplanar and non-coplanar forces, concurrent and non-concurrent forces, friction forces, hydrostatic forces, controids and moments of intertia, will be studied. An introduction to dynamic forces will be included.

CET 208. ROUTE SURVEYING. Class 1, Lab. 3, cr. 2. Prerequisite: CET 104.

Preliminary and construction surveys for highways and railroads, including simple compound, reverse, and easement curves, superelevation of curves, profiles, grade lines, slope stakes, yardage estimates and mass and haul diagrams.

CET 209. LAND SURVEYING AND SUBDIVISION. Class 1, Lab. 6, cr. 3. Prerequisites: CET 108 and CET 253.

Theory and practice of land surveying, subdivision, filing and recording deeds, United States government survey of public lands, laws of land surveying, descriptions and area computations for land surveys. Subdivision planning, calculations and plotting, water main layouts, storm and sanitary sewer calculations and layouts. Street plans and profiles.

CET 253. HYDRAULICS AND DRAINAGE. Class 3, cr. 3. Prerequisite: CET 160 or equivalent. Corequisite: MA 221 or equivalent.

Basic hydrostatics, Bernouilli's equation, flow in water and sewer lines, overland and ditch drainage, and culvert size determination.

CET 260. STRENGTH OF MATERIALS. Class 3, cr. 3. Prerequisite: CET 160 or equivalent. Corequisite: MA 221 or equivalent.

Study of stress-strain relationships, shear and bending moment diagrams, stresses and deflections of beams, axial loads, and combined

stresses. Applied problems in the field of structural design.

CET 266. MATERIALS TESTING. Class 1, Lab. 6, cr. 3. Prerequisite: CET 260.

Testing of construction materials to determine physical and mechanical properties. Preparation of reports from data secured from such tests.

CET 280. STRUCTURAL CALCULATIONS. Class 3, cr. 3. Prerequisite: CET 260.

Practice in the calculation of loads, reactions, shear, and moment for determinate structures. Introduction to indeterminate structures with emphasis on moment-distribution.

CET 281. APPLIED STRUCTURAL DESIGN. Class 1, Lab. 6, cr. 3. Prerequisite: CET 260.

Standard design procedures for steel and wood frame structures. Computation of loads, shears, moments and deflections. Sizing of beams, columns, and connections. Preparation of structural drawings.

CET 282. STRUCTURAL DETAILING. Class 1, Lab. 6, cr. 3.. Prerequisites: CET 260 and ART 150.

Detailing simple structural steel, reinforced concrete and wood structures, elementary design principles.

CET 299. CIVIL ENGINEERING TECHNOLOGY. Cr. 1-4.

Hours to be arranged with the staff. Primarily for third and fourth semester students. Subject matter to be assigned by the staff.

CET 366. MATERIALS TESTING II. Class 1, Lab. 6, cr. 3. Prerequisite: CET 266.

An introduction to testing structural elements and complete structures. Strain gauge measurements, instrumentation, and the design of tests to eliminate variables. Statistical analysis of text data.

CET 368. EXPERIMENTAL STRESS ANALYSIS LAB. Class 1, Lab. 3, cr. 2. Prerequisite: CET 266.

Introduction to and application of the use of electrical strain gages, brittle lacquers and photoelastic means of determining location, direction and magnitude of strains in scale and full-size structural systems and components.

CET 380. STRUCTURAL DESIGN STANDARDS. Class 3, Lab. 3, cr. 4. Prerequisite: CET 280.

Standard design procedures for the selection of steel, concrete and wood members, including shear, moment, and compression criteria, with emphasis on the limitations of these procedures.

CET 382. STEEL CONSTRUCTION. Class 2, Lab. 3, cr. 3. Prerequisite: CET 280.

Design of steel framed structures, including beams, columns, and connections. The preparation of structural drawings, and a study of erection practices.

CET 384. WOOD CONSTRUCTION. Class 2, Lab. 3, cr. 3, Prerequisite: CET 280.

Design of wood frame construction and the framework for concrete construction, including the preparation of structural and construction drawings.

CET 386. REINFORCED CONCRETE CONSTRUCTION. Class 4, cr. 4. Prerequisite: CET 280.

A study of concrete both as a construction material and as a structural meterial. Field methods of practices used in concrete construction. Fundamentals of reinforced concrete design as applied to beams, slabs, columns, walls, and footings.

CET 408. CONSTRUCTION OF HIGHWAYS. Class 1, Lab. 3, cr. 2. Prerequisites: CET 108 and CET 431.

Materials, design and construction methods used in asphalt and concrete pavements. Preliminary layout and design of intersections. Design and construction of highway subgrades.

CET 409. PROPERTY SURVEYING. Class 2, Lab. 3, cr. 3. Prerequisite: CET 209.

Office and field work associated with land surveying. Laws of land surveying, and public records of real property. Metes and bounds. Federal subdivison, and state plane coordinate descriptions.

CET 431. PROPERTIES AND BEHAVIOR OF SOILS. Class 2, Lab. 3, cr. 3. Prerequisite: CET 260.

Identification and properties of soils with emphasis on laboratory and field testing. Behavior of soils relating to design and construction of structures and highways.

CET 432. FOUNDATION CONSTRUCTION. Class 2, cr. 2. Prerequisites: CET 431 and CET 386 or equivalent.

Design and construction of shallow and deep foundations, excavating and bracing, and construction site dewatering.

CET 499. CIVIL ENGINEERING TECHNOLOGY. Cr. 1-4.

Hours, subject matter and credit to be arranged by staff. Course may be repeated for credit up to 9 hours.

CONSTRUCTION TECHNOLOGY

CNT 101. CONSTRUCTION LECTURES. Cr. 1.

Introduction and orientation to construction technology and career opportunities for graduates.

CNT 190. CONSTRUCTION OBSERVATION. Cr. 1.

Directed observation and inspection of construction work in progress on or near the campus. May be repeated twice.

CNT 198. CONSTRUCTION PRACTICE I. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

CNT 280. QUANTITY SURVEY AND ESTIMATING. Class 2, Lab. 3, cr. 3. Prerequisite: ART 150.

A study of methods to estimate quantities of materials required in construction. Practice in making quanitity surveys. Introduction in estimating labor and costs.

CNT 298. CONSTRUCTION PRACTICE II. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

CNT 340. CONSTRUCTION SCHEDULING. Class 2, cr. 2. Prerequisite: CNT 344.

A study of the planning and control of construction projects. Time schedules for materials, labor, and equipment; expediting material delivery; bar charts; and CPM scheduling.

CNT 344. CONSTRUCTION INSPECTION. Class 2, Lab. 3, cr. 3. Prerequisite: ART 276 and CNT 441.

Inspection procedures as applied to contracted construction, and the role inspection plays in the execution of the completed contract. The laboratory period is used for demonstration, guest lecturer presentations, and for field trips to construction sites, fabrication shops,and testing laboratories.

CNT 390. CONSTRUCTION EXPERIENCE. Cr. 1.

Minimum of 10 weeks work experience in the construction industry, with at least 5 weeks experience in the field. Written report of this experience.

CNT 398. CONSTRUCTION PRACTICE III. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

CNT 441. CONSTRUCTION OPERATIONS. Class 4, cr. 4. Prerequisite: Junior or senior standing.

Management, methods and equipment used in the construction of buildings, earthworks, bridges and roads. Contractor organization, job management, and safety. Excavation, formwork, concrete, masonry, and steel erection methods.

CNT 442. CONSTRUCTION COSTS AND BIDDING. Class 2, Lab. 3, cr. 3. Prerequisites: CNT 280 and CNT 441.

Estimating total job costs, and the study of bidding practices of the construction industry. Topics include: unit costs of materials and labor, quantity survey, overhead, subcontracts, total estimated costs, and bid price. The laboratory period is for the development of costs for an actual job.

CNT 445. CONSTRUCTION MANAGEMENT. Class 3, cr. 3. Prerequisite: MGMT 200.

Business policy and problems as they relate to construction companies. Contractors' organization, financial management, project management, supervision, cost analysis, and equipment economics.

CNT 498. CONSTRUCTION PRACTICE IV. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

CNT 499. SPECIAL ASSIGNMENTS. Cr. 1-4.

Hours, subject matter and credit to be arranged by staff. Course may be repeated for credit up to 9 hours.

DEPARTMENT OF ELECTRICAL ENGINEERING TECHNOLOGY

Charles E. Miller, Head

FACULTY: A. Ahmed, Akteruzzaman, R.L. Anderson, L.E. Brunner (Emeritus), J.D. Case, S.B. Jen, B. Javonovich, H. Lee, C.E. Miller, J. Rapal (Emeritus), R.W. Reach, N. Sorak, K. Steiner (Emeritus), T. Yackish.

The electrical engineering technology program is a (two plus two) curriculum that leads to the degree of Associate in Applied Science after completion of two years and the degree of Bachelor of Science after completion of four years. A central core of required courses contained in the first three semesters will provide the student with a good fundamental program in the electrical engineering technology field. The fourth semester plan of study allows a range of elective courses to meet the individual's field of interest. The program is designed to prepare graduates of the two year program for employment as technicians in research laboratories or in electronic industries involved in communications, electronics, industrial electronics, microwaves, computer electronics, audio, automation, electronic servicing, television, electrical power, aviation electronics and others. Graduates of the associate degree program in electrical engineering technology are eligible for certification as Associate Engineering Technicians.

The student who completes the plan of study and receives the degree of Associate in Applied Science is eligible to enter the Bachelor of Science program. He may specialize in audio, communications, control digital, industrial, medical, or power systems by the appropriate selection of courses in the EET option sequences. The particular technical electives selected in other fields (technical non-EET) will depend upon the student's major interest in EET and will support this major. Graduates of the Bachelor of Science degree program are prepared to do routine design work upon completion of an option sequence.

ASSOCIATE IN APPLIED SCIENCE DEGREE (ELECTRICAL ENGINEERING TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

FRESHMAN YEAR

First Semester	Second Semester
(4) EET 102 (Electrical Circuits 1)	(4) EET 152 (Electrical Circuits II)
(3) EET 104 (Electronics I: Vacuum Tubes and Transistors)	(4) EET 154 (Electronics II)
(5) MA 150 (Mathematics for Technology)*	(4) PHYS 218 (Physics: Mechanics and Heat)
(3) ENGL 104 (English Composition I)	(3) MA 221 (Calculus for Technology I)
(1) Computer Elective	
(16)	(15)

*The entering student may be placed in MA 147 (first of a two-course sequence, three credit hours) or in MA 150 based upon his SAT math score and number of years in high school math. Any entering student who has an SAT math score under 480 is strongly urged to take MA 147 during the summer session preceding entrance into full-time study. If placed in MA 147, the student must complete MA 148 in lieu of MA 150.

SOPHOMORE YEAR

Third Semester

(3) MA 222 (Calculus for Technology II)
(4) EET 204 (Electronics III)
(4) EET 212 (Electric Machinery)
(2) MET 157 (Electrical and Electronic Drafting)
(3) COM 114 (Fundamentals of Speech Communications)
(2) Fabrication Methods Elective

(18)

Fourth Semester

(4) EET 254 (Electronics IV: Digital Logic)
(4) EET elective†
(4) EET elective†
(3) Communications, humanities, or social science elective
(3) Science or mathematics elective

(18)

BACHELOR OF SCIENCE DEGREE (ELECTRICAL TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology

JUNIOR YEAR

Fifth Semester

(3) EET 383 (Advanced Electrical Networks)
(3) Science or mathematics elective
(3) Technical writing elective
(3) Computer elective
(3) Technical elective (Non-EET)

(15)

Sixth Semester

(4) EET elective
(3) Technical elective (Non-EET)
(3) Free elective
(3) HESS elective
(3) Communication elective

(16)

SENIOR YEAR

Seventh Semester

(4) EET elective
(1) EET 490 (Senior Project-Design)
(3) Technical elective (Non-EET)
(3) Science or mathematics elective
(3) HESS elective

(14)

Eighth Semester

(2) EET 491 (Senior Project-Construction)
(4) EET elective
(3) Technical elective (Non-EET)
(3) Technical elective (Non-EET)
(3) HESS elective
(3) Free elective

(18)

†The student may choose an EET elective in digital logic, communications, power, audio, medical instruction or controls, depending upon his field of interest.

CERTIFICATE PROGRAMS

Practical Industrial Electronics

Many industrial maintenance people now working in the fields of instrumentation and electricity have not had the opportunity to gain, through either formal education or experience, the knowledge needed in this new technology dealing with electronics. Purdue University Calumet offers a two-year certificate program in electronics to assist in this demand. The goal of the course is to present the material in such a fashion that electricians, instrument men, and maintenance personnel will obtain a basic background and working knowledge of the electronic techniques necessary to install, maintain, and trouble-shoot measuring systems, communication systems, and control systems.

As this is a non-credit practical program, admission will be granted to those individuals who can profit by the training offered. The University reserves the right to limit the enrollment in these courses. The two-year program follows:

Certificate Units **Course Number and Title**

First Semester

(4) EET 15 (Basic Electricity)

Second Semester

(4) EET 23 (Basic Electronics)

Third Semester

(4) EET 39 (Advanced Electronics)

Fourth Semester

(4) EET 41 (Digital Logic and Solid State Control Systems)

After completing the above sequence of courses, some persons specialize in the instrumentation field by enrolling in EET 51, MET 384, and MET 485.

Electrical Maintenance and Instrumentation Technology

The Electrical Maintenance and Instrumentation course of study is designed to supplement industry apprentice training programs with appropriate classroom activities to meet the specific industry requirements. Students enrolled in this course of study are normally employed by a specific industry and are assigned this curriculum to supplement their work related assignments. The entry requirements into the Electrical Maintenance and Instrumentation Technology program include a basic knowledge of high school level algebra I or equivalent and a related employment activity. The objective of the program is to present material that will supplement work experiences for Electricians, Instrument Repairmen, and Maintenance personnel who will install, maintain, and trouble-shoot measuring systems, communications systems, control systems, and other related electronic and electrical equipment.

Admission into this non-credit Electrical Maintenance and Instrumentation Technology program will be granted to those individuals who can profit by the training offered. The University reserves the right to limit the enrollment in these courses. The course of study for the program follows.

First Semester

(3) HEET 001 Applied Mathematics
(4) HEET 010 D.C. Circuits and Machinery

Second Semester

(4) HEET 020 A.C. Circuits and Machinery
(3) HEET 021 Crane Control Maintenance

Third Semester

(4) HEET 030 Motor Control
(3) HEET 031 Basic Electronics

Fourth Semester

(4) HEET 040 Adjustable Voltage Control
(3) HEET 041 Electrical Maintenance Techniques

Fifth Semester

(4) HEET 050 Linear Integrated Circuits
(3) HEET 051 Digital Circuit Concepts

Sixth Semester

(4) HEET 060 Industrial Control Systems
(3) HEET 061 Introd. to Computer Systems and Programming

PERSONAL SERVICE COURSES

Students successfully completing personal service courses EET or HEET 1 through 99 earn certificate units and not University credit.

EET 15. BASIC ELECTRICITY. Class 2, Lab. 4, Cert. Units 4.

The course covers consideration of basic d-c and a-c circuit theory, characteristics of series and parallel circuits, use of elementary test instruments and the cathode ray oscilloscope, the development of effective techniques and safety procedures, trouble-shooting, electrostatic and electromagnetic ideas, RLC circuits, phasor relationships, theory of inductors and transformers. Schematic diagrams are introduced as an integral part of the course.

EET 23. BASIC ELECTRONICS. Class 2, Lab. 4, Cert. Units 4.

General topics considered are electronic signals, amplitude, frequency harmonics, shaped waves, time constants, differentiators and integrators. Special attention to rectifiers, filters, regulator circuits, power supplies, amplifiers, electron tubes, semi-conductors, characteristics of discrete solid state devices, maximum power transfer, biasing, stabilization, current gain, photo-devices, SCR's load lines and feedback ideas. Continuing development of the use of schematic diagrams.

EET 39. ADVANCED ELECTRONICS. Class 2, Lab 4. Cert. Units 4.

Specialized circuit arrangements such as power supplies, voltage multipliers, regulators, types of amplifiers such as AF and RF, oscillators including LC, RC, QO, relaxation multivibrator, auxiliary circuits, SCR circuits and magnetic amplifiers are studied particularly in relation to their industrial applicability.

EET 41. DIGITAL LOGIC AND SOLID STATE CONTROL SYSTEMS. Class 2, Lab 4, Cert. Units 4.

This course considers TTL and DTL logic families as well as application rules. Particular attention is focused on the use of the scope for digital trouble-shooting. Also considered is the practical analysis of solid state SCR control and trouble-shooting analysis of SCR controls. Continued study and use of schematic diagrams is emphasized as they apply to solid state control.

EET 51. ELECTRONIC INSTRUMENTATION AND SYSTEMS. Class 2, Lab 4, Cert. Units 4.

A study of electronic instruments, recorders, controllers, sensing devices, transducers used in open loop systems, maintenance, trouble-shooting, adjustment, and calibration.

HEET 001. APPLIED MATHEMATICS. Class 3, Cert. Units 3.

A review of high school arithmetic and an introduction to algebra, geometry and trigonometry. A knowledge of trigonometry (sines, cosines, etc.) for a.c. circuit analysis will be developed.

HEET 010. D.C. CIRCUITS AND MACHINERY. Class 3, Lab. 2, Cert. Units 4.

A study of electricity, Ohm's law, series circuits, parallel circuits, series-parallel circuits, Kirchhoff's law, electromagnetism, ammeters, voltmeters, ohmmeters, bridges, d.c. generators, d.c. motors and d.c. motor control circuits.

HEET 016. BASIC ELECTRICITY. Class 5, Lab, 5, Cert. Units 7.

Basic electrical terms, units, symbols, and schematics are discussed. Equipment such as voltmeters, ohmmeters, ammeters, generators, and oscilloscopes are used during laboratory sessions. Magnetism, inductance, capacitance series and parallel circuits are considered. Basic principles of alternating current, inductive and capacitive reactance, phasors, power factor and resonance are studied.

HEET 020. A.C. CIRCUITS AND MACHINERY. Class 3, Lab 2, Cert. Units 4.

Alternating current waveforms and characteristics, inductance, capacitance, vectors, RL circuits, RC circuits, series and parallel LCR

circuits, transformers, a.c. generators and a.c. motors.

HEET 021. CRANE CONTROL MAINTENANCE. Class 3, Cert. Units 3.

The crane control course will, in general, follow the U.S.S. Corp. text outline. The text will be supplemented by hand-outs of additional material on crane control prints, plugging controls, etc.

HEET 024. BASIC ELECTRONICS. Class 5, Lab. 5, Cert. Units 7.

A study of transistor and vacuum tube fundamentals combined with the conventional electric and electronic circuit such as AM, FM, and side band transmission and reception are discussed as well as special electronic circuits such as clippers, clampers, multivibrators, blocking oscillators and sweep circuits. Trouble locating techniques are emphasized. TTL and DTL logic families and their application rules are studied; also considered is the practical analysis of SCR controls. Continued study and use of schematic diagrams is emphasized as they apply to solid state controls. Motors, generators, and power sources are also discussed.

HEET 025. MATHEMATICS FOR ELECTRONICS. Class 3, Cert. Units 3. Prerequisites: HEET 001.

A study of the fundamentals of mathematics as related to and applied to the study of Basic Electricity and Electronic Circuits.

HEET 030. THREE-PHASE AND MOTOR CONTROL. Class 3, Lab. 2, Cert. Units 4.

Single phase transformers, Wye and Delta connections of three phase transformers, motor speed control systems, full voltage control, medium voltage control, reduced voltage starting, multi-speed control and multi-motor control, synchronous motor controller, protection schemes.

HEET 031. BASIC ELECTRONICS. Class 3, Cert. Units 3.

Basic semiconductor physics, doping, P and N materials, P-N junctions, Zener diodes, PNP and NPN transistors, basic transistor configurations, four layer diodes, SCR's, tunnel diodes, UJT's, FET's and MOSFET's.

HEET 040. ADJUSTABLE VOLTAGE SYSTEMS. Class 3, Lab. 2, Cert. Units 4.

This course covers the Rotorol, magnetic amplifiers, operational amplifiers, unijunction firing circuits, current, voltage and speed regulators and regulator instability.

HEET 041. ELECTRICAL MAINTENANCE TECHNIQUES. Class 3, Cert. Units 3.

Topics included in this course are: diagrams, overload protection, relaying, flashover, communitation and d.c. machine adjustment, volt-amp-power measurements, component testing and coupling alignment.

HEET 050. LINEAR INTEGRATED CIRCUITS. Class 3, Lab 2, Cert. Units 4.

The course covers ideal and practical operational amplifier, with its specifications and limitations. Applications of operational amplifiers in industrial circuits are covered. Other integrated circuits are covered. Such as comparators, timers and phase locked loops. Specific industrial circuits, according to needs, are covered at the end.

HEET 051. DIGITAL CIRCUIT CONCEPTS. Class 3, Cert. Units 3.

The course covers number systems, Boolean algebra, logic elements and families and basics of logic design. Flip-flops, counters and shift registers conclude the concepts overview. Specific circuits are discussed according to the needs of industry.

HEET 060. INDUSTRIAL CONTROL SYSTEMS. Class 3, Lab. 2, Cert. Units 4.

The course covers the concepts of the closed loop industrial control, using the block diagram method. The components of each block are also discussed, in the light of the previous two courses on Digital and Linear circuits. Specific regulating systems (speed, tension, position) are covered according to the needs of industry.

HEET 061. INTRODUCTION TO COMPUTER SYSTEMS AND PROGRAMMING. Class 3, Cert. Units 3.

The course covers introduction to serial and parallel operation of digital circuits, binary arithmetic, computer architecture, timing and control. It also covers basic input-output concepts, A/D and D/A conversion and assembly language programming. Concept of microcomputers is also introduced.

UNDERGRADUATE LEVEL

EET 102. ELECTRICAL CIRCUITS I. Class 3, Lab. 3, cr. 4. Prerequisite or corequisite: MA 148 or MA 150.

A study of DC electrical circuits, Ohm's Law, Kirchhoff's Laws, series and parallel circuits, power, introductory magnetism, ammeters, voltmeters, ohmmeters, inductance, capacitance, and an introduction to alternating voltages, currents, and reactances.

EET 104. ELECTRONICS I. Class 2, Lab 3, cr. 3. Prerequisite or corequisite: EET 102 or consent of instructor.

An introduction to conductors, semiconductors, insulators, and the physical construction and elementary operation of electron tubes, solid-state diodes, and transistors. Includes characteristic curves and properties related to DC load lines. An introduction to the use of electronic calculators and digital computers.

EET 152. ELECTRICAL CIRCUITS II. Class 3, Lab. 3, cr. 4. Prerequisite: EET 102 and MA 148 or MA 150.

A study of DC and AC electrical circuits network theorems, j operator, phasors, reactances, impedances, phase relationships, power,

resonance, ideal and air-core transformers and an introduction to graphical techniques and transients.

EET 154. ELECTRONICS II. Class 3, Lab. 3, cr. 4. Prerequisites: EET 102, and 104; prerequisite or corequisite: EET 152.

A study of the characteristics and applications of transistors, integrated circuits, and other solid-state devices. Includes rectifier circuits, waveform interpretation, AC and DC load lines, biasing techniques, equivalent circuits, single and multistage class A small-signal amplifiers, and h parameters.

EET 204. ELECTRONICS III. Class 3, Lab. 3, cr. 4. Prerequisites: EET 152, 154 and MA 221.

A study of the applications of transistors, integrated circuits, and other solid-state devices. Feedback principles as applied to amplifiers, oscillators, and regulated power supplies. Includes large-signal power amplifiers, special-purpose amplifiers, and AM and FM modulation and detection techniques. Introduction to filters as applied to tuned amplifiers and rectifier circuits.

EET 212. ELECTRICAL POWER AND MACHINERY. Class 3, Lab. 3, cr. 4. Prerequisite: EET 152 and PHYS 218.

A study of power transformers, single and polyphase circuits, and an introduction to the National Electric Code. The study of DC machines and AC single and polyphase synchonous and induction machines.

EET 254. DIGITAL FUNDAMENTALS. Class 3, lab. 3, cr. 4 or Class 3, lab. 2, cr. 4. Prerequisite: EET 154.

An introduction to combinational and sequential digital circuits and techniques. Topics include: number systems, logic gates and families, Boolean algebra, mapping techniques, flip-flops, counters and shift registers.

EET 270. INTRODUCTION TO AUDIO. Class 3, Lab. 3, cr. 4. Prerequisites: MA 222, PHYS 218.

An introduction to audio in four parts: basic acoustic psychoacoustics including loudness sensation, pitch sensation and directionality; architectural acoustics; and an introduction to the disc recording-reproducing system measurements.

EET 276. ELECTRONIC TROUBLE SHOOTING LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: EET 204.

Experimental work in analyzing or repairing equipment. The use of test instruments to locate faulty components in AM and FM receivers, television, and industrial circuits.

EET 299. ELECTRICAL ENGINEERING TECHNOLOGY. cr. 1-6.

Hours and subject matter to be arranged by staff. Course may be repeated for credit up to six hours.

EET 302. ELECTRO-MECHANICAL CONTROL COMPONENTS. Class 3, Lab. 2, cr. 4. Prerequisites: EET 154 and MA 221; prerequisite or corequisite: EET 212.

A study of the components in open-loop systems. Included are sensing devices, error detectors, potentiometers, synchros, resolvers, modulators, demodulators, amplifiers, motors, generators, and networks. An analysis course that stresses operation, time-and-frequency response characteristics, and proper adjustment of the components.

EET 303. COMMUNICATIONS I. Class 3, Lab. 2, cr. 4. Prerequisites: EET 204 and MA 222 or consent of instructor.

A study of AM and FM modulation and detection, receivers, transmitters, networks, filters, antennas, and transmission lines through the VHF frequency spectrum.

EET 310. BIOMEDICAL INSTRUMENTATION I. Class 3, cr. 3. Prerequisites: EET 204, EET 254.

An introduction to physiological variants, the concept of measurements and problems encountered in measurements from a living human body. Detail study of transducer principles and circuit techniques in measurement in circulatory, digestive, muscular and nervous systems. System approach to intensive care monitoring and data acquisition. Evaluation of biomedical instruments to meet performance specifications and electrical safety.

EET 316. TELEVISION I. Class 3, Lab. 2, cr. 4. Prerequisite: EET 204.

A study of television transmission and receiving systems. Includes analysis of transmitted signal, FM, video amplifiers, power supplies, synchronization, deflection alignment, and antennas.

EET 317. DIGITAL CIRCUITS AND SUBSYSTEMS. Class 3, Lab. 2, cr. 4. or Class 3, Lab. 3, cr. 4. Prerequisite: EET 254.

A study of arithmetic functions and circuits, codes and code conversions, error checking, memories, systems considerations, and an introduction to A/D and D/A conversion.

EET 331. GENERATION AND TRANSMISSION OF ELECTRICAL POWER. Class 3, Lab. 2, cr. 4. Prerequisite: EET 212.

A study of the generation and transmission of electrical energy. Includes techniques used by electric utilities for the protection of generating equipment and transmission lines, an introduction to the economic considerations of power plant operation, and three-winding transformers and methods of solving unbalanced three-phase systems.

EET 352. ELECTRONICS APPLICATIONS. Class 3, Lab. 2, cr. 4. Prerequisites: EET 204 and MA 222.

A study of the applications of the fundamental electrical and electronic circuits in various specialty areas. Includes selected topics such as

oscillators, synchronizing sweep circuits, high-voltage power supplies, wide-band amplifiers, closed-loop feedback systems, transmission lines, UHF, VHF, radar, digital circuits, medical electronics, magnetic amplifiers, transducers, display devices, and lasers.

EET 364. ELECTRICAL MEASUREMENTS. Class 3, cr. 3. Prerequisite or corequisite: EET 254.

An advanced study of electrical instruments used to measure electric and nonelectric quantities. Explains instrument limitations, calibration procedures, possible errors, and industrial applications. Includes the analysis of precision voltmeters, ammeters, AC and DC bridges, potentiometers, and frequency standards.

EET 365. ELECTRICAL MEASUREMENTS. Class 3, Lab. 2, cr. 4. Prerequisite: EET 254.

An advanced study of electrical instruments used to measure electric and non-electric quantities. Explains instrument limitations, calibration procedures, possible errors, and industrial applications. Includes the analysis of precision voltmeters, ammeters, AC and DC bridges, potentiometers and frequency standards.

EET 368. LINEAR INTEGRATED CIRCUITS. Class 3, Lab. 2, cr. 4. Prerequisites: EET 204 and 383 or consent of instructor.

A study of the application of I.C. operational amplifiers, I.C. differential amplifiers to a multitude of applications. Specifications and limitations will also be stressed. Various special purpose I.C.'s that perform one given function will also be investigated.

EET 370. AUDIO COMPONENT DESIGN. Class 3, Lab. 3, cr. 4. Prerequisites: EET 383 or equivalent and EET 270.

An acoustic hardware course covering four main device areas; acoustic to electrical analogies including acoustic filters (mufflers, etc.); direct radiating loudspeakers and enclosures including acoustic suspension and base reflex designs; horn loaded loudspeakers and microphone designs.

EET 380. NETWORK ANALYSIS FOR TECHNOLOGY. Class 3, cr. 3. Prerequisites: MA 222, EET 152.

An advanced course in network analysis that utilize matrix, determinants, complex quantities and phasor concepts, network theorems, Fourier analysis, transfer functions, Bode diagrams and system stability.

EET 383. ADVANCED ELECTRICAL NETWORKS. Class 3, cr. 3. Prerequisites: EET 212 and MA 222.

An advanced course in network analysis that stresses network theorems, solutions of time- and frequency-domain problems.

EET 415. MEDICAL ELECTRONICS. Class 2, Lab. 2, cr. 3. (Not open to EET student.)

A survey covering the fundamental concepts of electricity and electronics as they relate to the medical field. Emphasis will be placed upon the safe and effective operation of electrical and biomedical electronic equipment.

EET 417. ANALOG AND DIGITAL CIRCUITS. Class 3, Lab. 2, cr. 4. or Class 3, Lab. 3, cr. 4.

Advanced study of A/D and D/A conversion, digital data acquisition and transmission, switching power supplies, phase lock techniques and an introduction to digital filters.

EET 454. MICROPROCESSOR FUNDAMENTALS. Class 3, Lab. 2, cr. 4. Prerequisites: EET 317 or consent of instructor and CS 200 or CIS 200 or equivalent.

Use of microprocessors and related components in the design of microprocessor based systems. The architecture, programming, and interfacing of microprocessors is studied. Consideration is given to the trade-offs between hardware and software.

EET 463. COMMUNICATIONS II. Class 3, Lab. 2, cr. 4. Prerequisites: EET 303 and 383.

A study of high frequency systems (1-meter or less) and microwave technology to familiarzie the student with the fields of radar, facsimile, television, transmission lines, antennas, propagation, wave guides and cavities, and measuring equipment.

EET 470. ELECTRONICS IN MUSIC. Class 3, Lab. 3, cr. 4. Prerequisites: EET 254 or equivalent.

An introduction to electronics in music covering two main topic areas, music theory with basic harmony; and the structure of modern electronic musical instruments (including guitars) starting with the traditional organ configuration.

EET 472. AUTOMATIC CONTROL SYSTEMS. Class 3, Lab. 2, cr. 4. Prerequisites: EET 302 and 383 or consent of instructor.

The transfer function approach to the study of feedback control systems. Stability criteria are examined. Uses of Nichols charts, Bode diagrams and root-locus plots to predict performance are studied. Analog and digital simulation is introduced and various techniques are applied to selected industrial control systems.

EET 475. COMMUNICATIONS III, ANTENNAS AND PROPAGATION. Class 3, Lab. 2, cr. 4. Prequisites: EET 303, EET 463.

A study of electromagnetic waves, reflection, refraction, transmission lines, impedance matching, antenna patterns, antenna gain, directivity, bandwidth, beam-width, radiation resistance, polarization, short dipoles, the half wave dipole, long wire antennas, loop antennas, helical antennas, horn radiators, slot radiators, arrays, reflectors and lenses, and log periodic antennas.

EET 490. SENIOR DESIGN PROJECT PHASE I. Cr. 1, hours arranged. Prerequisite: consent of instructor.

An extensive individual design and/or analytical project performed in consultation with one or more faculty advisors. Collaboration with representatives of industry, government agencies, or community institutions is encouraged. Evidence of extensive and thorough laboratory performance is required.

PHASE I includes, but is not limited to: (1) faculty acceptance of project proposal, (2) defining and limiting project objectives, (3) initial research and source contacts, (4) procurement of materials, and (5) periodic progress reports.

EET 491. SENIOR DESIGN PROJECT, PHASE II. Cr. 2-5, hours arranged. Prerequisite: EET 490.

PHASE II includes, but is not limited to: (1) Continued research and finalized design, (2) oral presentation to faculty and other interested parties, and (3) standard format written technical report.

EET 499. ELECTRICAL ENGINEERING TECHNOLOGY. Cr. 1-9, hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

DEPARTMENT OF ENGINEERING

Severino L. Koh, Head

FACULTY: B.G. Burridge, E.H. Buyco, W.Y. Chen, I. Eisenstein (Emeritus), R.L. Gonzales, D.K. Goodman, S.L. Koh, S.H. Mousavinezhad, J.H. Packer, B.K. Pai, D.A. Radman.

Professional engineering has been defined as the art and science which adapts materials found in nature to more useful forms and harnesses natural forces to do man's work, at a reasonable cost in both time and energy. As a result of his education and training, the professional engineer is able to apply the scientific method and perspective to solve problems, create new products, and assume responsibility in fields of research, designing, manufacturing and managing.

The engineering curriculum provides the opportunity for a thorough education in the physical sciences, the engineering sciences and mathematics and the application of these fundamentals to the solution of problems encountered in engineering practice. The curriculum also enables the engineering student to develop capabilities in the effective communication of ideas by means of spoken and written language as well as graphical techniques. Finally, the engineering curriculum affords a sound introduction to the social studies and humanities. Thus the engineering student, through his studies, work experiences, and membership in professional societies, receives the foundation to prepare him to enter the practice of professional engineering or to begin a program of graduate studies.

The engineering studies in the four-year program lead to a **Bachelor of Science in Engineering (B.S.E.)** degree. Students can pursue their studies in either **Electrical Engineering (EE)** or in **Mechanical Engineering (ME).** Both these programs are accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET), formerly the Engineers' Council for Professional Development (ECPD). A third program in engineering, **Interdisciplinary Engineering (IDE),** is available for students interested in other engineering disciplines (Chemical, Civil, Materials, etc.) or in a combination of engineering with non-engineering disciplines, e.g. biomedical engineering, environmental engineering or engineering management.

The freshman and sophomore years are identical for all three options in engineering. The variations in the options are in the junior and senior years. A sizable number of required courses are specified in the mechanical engineering and electrical engineering options with some flexibility in the choice of some electives in technical fields and in

general education. Greater flexibility in the choice of the technical electives is built into the junior and senior years of the IDE program. This allows the student with the guidance of the faculty to develop a plan of study of sufficient breadth and concentration in areas of specific interest.

Cooperative Engineering Education Program

Career choice is often a difficult problem. In the engineering profession, however, there is a way of getting acquainted with a career in combination with obtaining an education. This is the Cooperative Engineering Education program. Cooperative Engineering Education is a five year plan of study in which the student alternates periods of attendance at the university with periods of employment in engineering related jobs in industry or government. While participating in the program the student obtains practical industrial experience. The monetary aspect of employment helps to defray part of the cost of the engineering education.

Engineering Laboratories

Laboratory facilities in the Department of Engineering for undergraduate instruction include: Electrical Engineering Laboratories, Engineering Computer Laboratories, and Mechanical Engineering Laboratories.

These laboratories are also used for graduate instruction and research work.

Electrical Engineering Laboratories

The Department of Engineering has a wide variety of well-equipped laboratory facilities to support the laboratory activities and needs of the student in Electrical Engineering.

Equipment is available for experimentation ranging from the elementary to the advanced in areas such as electronic circuits, electron devices, energy conversion, electrical machinery, control systems, digital systems, and communication systems.

Engineering Computer Laboratory

The computer laboratory facilities within the Department of Engineering and available for use by the Department of Engineering cover the complete spectrum of computer types including Analog, Hybrid and Digital computers and ranging from microcomputers to large computer systems.

Mechanical Engineering Laboratories

The Department of Engineering supports the Mechanical Engineering option with a number of modern well equipped laboratories.

The laboratories provide a means for a wide range of experimentation. They include a Fluid and Energy Laboratory, a Materials and Metallurgical Engineering Laboratory, and a Systems Dynamics and Mechanical Measurements Laboratory.

COURSE PREPARATION FOR ENTERING STUDENTS

Only those students with adequate preparation will be expected to accomplish the freshman year of study in two semesters. Students with inadequate background training, particularly in mathematics and chemistry may require an additional semester or summer session to attain sophomore standing.

Mathematics Preparation:

Students with no high school trigonometry and those with SAT math score below 570 are advised to enroll in MA 151 before enrolling in MA 163.

Chemistry Preparation:

a) Students who are well prepared (i.e., 1 year of high school Chemistry and Chemistry Composite Score between 500 and 570) may enter CHM 115.
b) Students who do not meet the criteria set forth above should first enroll in CHM 111 and then take CHM 112.

PLANS OF STUDY
BACHELOR OF SCIENCE IN ENGINEERING DEGREE

Options: Interdisciplinary Engineering (IDE)
Electrical Engineering (EE)+
Mechanical Engineering (ME)+

NOTE: The freshman and sophomore years are common to all options.

FRESHMAN YEAR

First Semester

(5) MA 163 (Calculus and Analytic Geo. I)
(4) CHM 115 (General Chemisry)
(2) ENGR 190 (Elementary Engr. Design)
(3) COM 114 (Speech Communication)
(2) ENGR 114 (Engineering Drawing)
(1) ENGR 140 (Introductory Engineering I)

(17)

Second Semester

(5) MA 164 (Calculus & Analytic Geo. II)
(4) PHYS 152 (Mechanics)
(3) ENGL 104 (English Composition I)
(3) (Science Elective)**
(1) ENGR 160 (Introductory Engineering II)

(16)

SOPHOMORE YEAR

Third Semester

(4) MA 261 (Multivariate Calculus)
(4) PHYS 261 (Electricity & Optics)
(3) ME 271 (Basic Mechanics I Statics)
(3) EE 201 (Linear Circuit Analysis I)
(1) EE 207 (Electronic Measurement Techniques)
(3) (General Education Elective)*

(18)

Fourth Semester

(4) MA 262 (Linear Algebra & Diff. Eqns.)
(3) ME 275 (Basic Mechanics II Dynamics)
(3) EE 202 (Linear Circuits Analysis II)
(1) EE 218 (Linear Circuits Laboratory II)
(3) MSE 200 (Materials Science)
(3) (General Education Elective)*

(17)

+Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.
*See "General Education Electives".
**See "Science and Technical Elective Requirements".

INTERDISCIPLINARY ENGINEERING OPTION (IDE)

(Total Credits — 130 Semester Hours Minimum)

JUNIOR YEAR

Fifth Semester

(3) ME 305 (General Thermodynamics I)
(3) ENGR 325 (Dynamics of Physical Systems)
(3) (Technical Elective)**
(3) (Technical Elective)**
(3) (General Education Elective)*

(15)

Sixth Semester

(3) ENGR 380 (Computers in Engineering Analysis)
(3) (Technical Elective)**
(4) (Technical Elective)**
(4) (Technical Elective)**
(3) (General Education Elective)*

(17)

SENIOR YEAR

Seventh Semester

(2) ENGR 440 (Senior Engineering Design I)
(3) ENGR 483 (Intro. to Control Systems
(3) (Technical Elective)**
(3) (Technical Elective)**
(4) (Technical Elective)**

(15)

Eighth Semester

(3) ENGR 460 (Senior Engineering Design II)
(3) (Technical Elective)**
(3) (Free Elective)
(3) (Technical Elective)**
(3) (General Education Elective)*

(15)

ELECTRICAL ENGINEERING OPTION (EE)

(Total Credits — 129 Semester Hours Minimum)

Accredited by the Engineering Accreditation Commission of the Accrediting Board for Engineering and Technology.

JUNIOR YEAR

Fifth Semester

(3) EE 275 (Electronics — Devices)
(3) EE 311 (Electric and Magnetic Fields)
(3) EE 366 (Digital Systems — Logic Design)
(1) EE 367 (Digital Systems — Logic Design Lab)
(3) ENGR 325 (Dynamics of Physical Systems)
(3) (General Education Elective)*

(16)

Sixth Semester

(3) ENGR 380 (Computers in Engineering Analysis)
(3) EE 321 (Intro. Electric Energy Engr)
(1) EE 322 (Electromech Energy Conv Lab)
(3) EE 322 (Network Design)
(3) EE 335 (Electronics — Systems)
(3) (General Education Elective)*

(16)

*See "General Education Electives".
**See "Science and Technical Elective Requirements".

SENIOR YEAR

Seventh Semester

(2) ENGR 440 (Senior Engineering Design I)
(3) ENGR 483 (Intro. to Control Systems)
(3) EE 448 (Intro. to Communication Theory)
(3) ME 305 (General Thermodynamics I)
(3) (Technical Elective)**

(14)

Eighth Semester

(3) ENGR 460 (Senior Engineering Design II)
(3) Technical Elective)**
(3) (Technical Elective)**
(3) (Free Elective)**
(3) (General Education Elective)*

(15)

MECHANICAL ENGINEERING OPTION (ME)

(Total Credits — 130 Semester Hours Minimum)
Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

JUNIOR YEAR

Fifth Semester

(3) ME 305 (General Thermodynamics I)
(3) CE 273 (Mechanics of Materials)
(3) ENGR 325 (Dynamics of Physical Systems)
(3) ME 320 (Kinematic Analysis and Design)
(3) MSE 344 (Materials in Engineering)

(15)

Sixth Semester

(3) ME 306 (General Thermodynamics II)
(3) ENGR 380 (Computers in Engineering Analysis)
(3) ME 312 (Fluid Mechanics)
(1) ME 313 (Fluid Mechanics Laboratory)
(3) ME 345 (Mechanical Engr. Experimentation)
(3) (General Education Elective)*

(16)

SENIOR YEAR

Seventh Semester

(2) ENGR 440 (Senior Engineering Design I)
(3) ENGR 483 (Intro. to Control Systems)
(3) ME 416 (Heat Transmission)
(1) ME 417 (Heat Transmission Laboratory)
(4) ME 461 (Mechanical Engineering Design)
(3) (General Education Elective)*

(16)

Eighth Semester

(3) ENGR 460 (Senior Engineering Design II)
(3) (Technical Elective)**
(3) (Free Elective)**
(3) (Technical Elective)**
(3) (General Education Elective)*

(15)

*See "General Education Electives".
**See "Science and Technical Elective Requirements".

SCIENCE AND TECHNICAL ELECTIVE REQUIREMENTS

1. **Science Elective** — Open (CHM 116 is suggested, but any other course in biology, chemistry, geoscience or physics may be taken except GEOS 100 and provided no redundancy occurs).
2. **Technical Electives — ME and EE Options**
   a. One elective is "free" (can be anything).
   b. The remaining technical electives from 300, 400 or 500 offerings in engineering, science, math (including Stat and Comp Sci), and Management with the exception of CE 273 for other than ME option or EE 275 for other than EE option.
3. **Technical Electives — Interdisciplinary Option (IDE)**
   a. One elective is "free" (can be anything).
   b. An additional four (4) technical electives will be chosen by the student and his advisor. These electives must meet the requirements of 3(e).
   c. Of the remaining six (6) technical electives
      1. **at least four (4)** electives from 300, 400 or 500 offerings in Engineering
      2. **no more than two (2)** from 300, 400 or 500 offerings in science, math (including Stat and Comp Sci) and Management.
   d. Care must be taken to insure that at least six (6) hours (composite) of the total 33 hours of technical electives are design oriented.
   e. The electives of 3(b) must meet approval of the curriculum committee. Students in this program must submit, and obtain approval of, their plan of study before beginning the fourth semester of study.
4. Electives offered under experimental numbers must have approval of the Department Head to be included in a plan of study.

Suggested Electives

The required sequences of the electrical and mechanical engineering options of the department provide a solid, broad-based undergraduate education in these traditional fields. Many elective sequences have been developed to provide additional expertise in a specific area of student interest. These sequences are available from an engineering advisor, however, a few specific examples are as follows:

For an Electrical Engineering student interested in:

Digital Systems: EE 330 Digital Systems — Software, EE 430 Digital Systems — Design.

Power Engineering: EE 432 Power System Engineering, EE 525 Analysis of Electromechanical Systems, EE 532 Computational Methods for Power Systems Analysis.

For a Mechanical Engineering student interested in:

Dynamics: ME 560 Kinematics, ME 563 Mechanical Vibrations.

Environmental Engineering: ME 418 Air Conditioning Systems, ME 528 Air Pollution.

Materials Testing: MSE 385 Nondestructive Testing, MSE 597C Mechanical Behavior of Materials.

GENERAL EDUCATION ELECTIVES

Purdue University has developed a strong program in general education to provide the engineering student an integrated and well rounded program in the social sciences, fine arts, and humanities.

A total of 21 hours of general education courses is required in the engineering curricula. The freshman year in engineering includes:

English (ENGL 104 — 3 hours)
and
Speech (COM 114 — 3 hours)

The balance of the program (15 hours) is to be selected by the student and his advisor in line with the following two recommendations:

1. In choosing the elective part of the general education program, the student and his advisor should reach a compromise between the following guiding principles:
   a. The student should have the opportunity to explore different areas.
   b. The student's general education program should have a unifying framework and constitute a coherent experience.
2. Those courses treating subjects such as accounting, industrial management, personal finance, ROTC, and personnel administration are **not** considered as fulfilling the purposes of the general education program, regardless of their general value in the total engineering curriculum. In addition, introductory language courses should **only** be included as part of a sequence of at least six hours.

It is suggested that the general education program of a student be drawn from not more than two different sequences (preferably belonging to two different groups and **it is required** that at least six credit hours be drawn from the same sequence. Ideally this program would include:

1. six credit hours **from one sequence in one group;**
   and
2. nine credit hours from **one sequence in another group.**

The sequences proposed have been divided into four groups as follows:

GROUP I: Foreign Languages, Communication, Creative Arts;
GROUP II: History, Philosophy, Literature;
GROUP III: Economics, Political Science; and
GROUP IV: Psychology, Sociology, Anthropology.

ENGINEERING CURRICULUM COURSES

UNDERGRADUATE LEVEL

CE 273. MECHANICS OF MATERIALS. Class 3, cr. 3. Prerequisites: MA 261, ME 271.

Deformation, strain, stress, equations of equilibrium. Elastic stress-strain relation. Theory of tension, bending, torsion. Plastic deformation, yield criterion. Stress-strain relation of plasticity. Application to bending and torsion. Elements of limit analysis, viscoelastic bodies, simple models, non-linear creep.

EE 201. LINEAR CIRCUIT ANALYSIS I. Class 3, cr. 3. Corequisites: MA 261, PHYS 261, EE 207.

Volt-ampere characteristics of circuit elements; independent and dependent sources; Kirchoff's Laws and circuit equations. Source transformations; Thevenin's and Norton's Theorems; Superposition. Transient response of RC, RL, and RLC circuits. Sinusoidal steady-

state and impedance. Instantaneous and average power.

EE 202. LINEAR CIRCUIT ANALYSIS II. Class 3, cr. 3. Prerequisites: EE 201. Corequisites: MA 262, EE 218.

A continuation of EE 201. The complex frequency plane; resonance; coupled circuits. Two-port network parameters. Polyphase analysis. Fourier series; Fourier Transform; Laplace Transform.

EE 207. ELECTRONIC MEASUREMENT TECHNIQUES. Lab. 3, cr. 1. Corequisite: EE 201.

Introduction to basic instrumentation and measurement techniques; introduction to the experimental methods necessary for laboratory investigation. Introduction to laboratory report writing methods. The student is introduced to computer-aided circuit analysis methods.

EE 218. LINEAR CIRCUITS LABORATORY II. Lab. 3, cr. 1. Corequisite: EE 202.

A continuation of EE 207, with the introduction of advanced measurement methods and more sophisticated instrumentation.

EE 275. ELECTRONICS-DEVICES. Class 2, Lab. 3, cr. 3. Prerequisites: EE 202, EE 218.

Transport phenomena in semiconductors; junction diode theory; diode circuits. Bipolar Junction Transistor and Field Effect Transistor theory and characteristics, transistor biasing and stabilization techniques. Low and high frequency analysis of transistors. Multistage amplifier analysis and design.

EE 300. ELECTRONIC DEVICES AND CIRCUITS. Class 2, Lab. 3, cr. 3. Prerequisite: EE 201.

Topics in semiconductor devices and their applications in electronic circuits. Diodes, linear amplifiers, FET and BJT circuits, oscillators, multistage amplifiers, feedback, differential and power amplifiers. Not suitable for technical elective credit in Electrical Engineering option.

EE 311. ELECTRIC AND MAGNETIC FIELDS. Class 3, cr. 3. Prerequisites: MA 262, PHYS 261.

Continued study of vector calculus, electrostatics, and magnetostatics. Maxwell's equations. Introduction to electromagnetic waves, transmission lines, and radiation from antennas.

EE 321. INTRODUCTION TO ELECTRIC ENERGY ENGINEERING. Class 3, cr. 3. Prerequisite: EE 311.

Energy needs and sources, transformers, electromechanical and nonconventional energy conversion, transmission, power system characteristics.

EE 322. ELECTROMECHANICAL ENERGY CONVERSION LABORATORY. Lab. 3, cr. 1. Corequisite: EE 321.

Laboratory exercises in the basic electromechanical energy conversion processes and fundamental devices. DC motors and generator characteristics. Synchronous motor and generator characteristics, induction motors.

EE 330. DIGITAL SYSTEMS — SOFTWARE. Class 2, Lab. 3, cr. 3.

Digital software used in the control of digital hardware processors and peripheral devices. Basic computer logic; Boolean Algebra; number systems; integer, fixed point, and floating point representations. Introduction to computer architecture and hardware devices as exercised by machine level and assembly level words. Emphasis is placed on software complimentation of hardware design.

EE 332. NETWORK DESIGN. Class 3, cr. 3. Prerequisite: EE 202.

Introduction to advanced circuits topics. Matrix description of circuit concepts. The Indefinite Admittance Matrix. Introduction to passive and active filtering methods. Introduction to Digital Filtering. More exposure to the use of the Fourier and Laplace Transform in the analysis process.

EE 335. ELECTRONICS — SYSTEMS. Class 2, Lab. 3, cr. 3. Prerequisite: EE 275.

Topics in multistage amplifiers, feedback amplifiers, oscillators, operational amplifiers, analog systems, power amplifiers and systems, communication systems.

EE 366. DIGITAL SYSTEMS — LOGIC DESIGN. Class 3, cr. 3.

Introduction to the logical design and analysis of digital systems. Introduction to Boolean Algebra; combinational logic; minimization techniques, Karnaugh mapping methods. Introduction to sequential systems analysis and design; binary arithmetic; the binary accumulator.

EE 367. DIGITAL SYSTEMS — LOGIC DESIGN LABORATORY. Lab. 3, cr. 1. Corequisite: EE 366. Prerequisite: EE 218.

Theoretical design and laboratory prototyping of various digital systems whose complexity range from simple combinational logic circuits to complex sequential logic circuits. The student uses integrated circuit logic elements, where their electronic and logical characteristics are considered.

EE 409. PROFESSIONAL ENGINEERING. Class 3, cr. 3. Prerequisite: senior classification.

Value and use of money; depreciation, economic selection, cost determination; business law, engineering procedures, and professional ethics.

EE 416. DIGITAL SYSTEMS — ELECTRONICS. Class 2, Lab. 3, cr. 3. Prerequisite: EE 275.

Analysis and design of digital electronic circuits. Registor logic; diode logic; direct coupled transistor logic; resistor-transistor logic (RTL); diode-transistor logic (DTL): transistor-transistor logic (TTL); emitter coupled logic (ECL). The bistable, monostable, and astable multivibrators. The Schmidt trigger. Introduction to MOS devices. Introduction to negative resistance switching devices and circuits.

EE 430. DIGITAL SYSTEMS — DESIGN. Class 2, Lab. 3, cr. 3. Prerequisite: EE 330.

Digital hardware and software techniques are implemented in the design of a selected project in the field of digital systems. A seminar course in its basic strucutre, lectures are provided by the students, the instructor, and by guest lecturers in the computer field.

EE 432. ELEMENTS OF POWER SYSTEM ENGINEERING. Class 3, cr. 3. Prerequisite: EE 321.

Fundamental concepts and operation considerations of power systems, basic component model representations, steady-state performance, operating strategies and control of power systems.

EE 448. INTRODUCTION TO COMMUNICATION THEORY. Class 3, cr. 3. Prerequisite: ENGR 325.

Signal analysis, introduction to amplitude, frequency, and pulse code modulation systems. Probability theory and representation of random phenomenon. Introduction to information theory.

EE 495. SELECTED TOPICS IN ELECTRICAL ENGINEERING. Cr. 1-4.

EE 496. ELECTRICAL ENGINEERING PROJECTS. Hours and credits to be arranged.

ENGR 114. ENGINEERING DRAWING. Lab. 6, cr. 2.

A technical drawing course covering geometric constructions, pictorial and multiview drawing, sections, graphical vector solutions, dimensioning, detail and assembly drawings. Development of freehand sketching techniques as well as the use of drafting instruments.

ENGR 140. INTRODUCTORY ENGINEERING I. Class 1, cr. 1.

An introduction to the engineering profession and computer programming techniques using the BASIC programming language. Flow charts and the organization of programming logic which is applicable to BASIC as well as all other computer languages. The basics of the BASIC language will be treated and a number of examples and engineering applications will be used to illustrate programming techniques.

ENGR 160. INTRODUCTORY ENGINEERING II. Class 1, cr. 1. Prerequisite: ENGR 140.

Further lectures on the engineering profession and an introduction to computer programming techniques using the FORTRAN language. Emphasis on engineering applications.

ENGR 190. ELEMENTARY ENGINEERING DESIGN. Class 1, Lab. 3, cr. 2.

An introduction to engineering design.

ENGR 325. DYNAMICS OF PHYSICAL SYSTEMS. Class 3, cr. 3. Prerequisites: EE 202, ME 275.

Analytical models of physical elements and systems; linearization and superposition. Natural and forced response for mechanical, electrical, and other physical systems. Dynamic characteristics and stability of systems; state variable methods and S-plane analysis. Convolution, Fourier and Laplace techniques.

ENGR 380. COMPUTERS IN ENGINEERING ANALYSIS. Class 2, Lab. 3, cr. 3. Prerequisites: MA 262, ME 275.

Theory and application of analog, digital and hybrid simulation in the solution and analysis of engineering problems. Development of mathematical models suitable for computer solutions, and numerical analysis techniques will be discussed and applied.

ENGR 440. SENIOR ENGINEERING DESIGN I. Class 1, Lab. 3, cr. 2. Prerequisite: Must have completed option requirements of Junior Year.

See ENGR 460 — Senior Engineering Design II.

ENGR 460. SENIOR ENGINEERING DESIGN II. Class 1, Lab. 6, cr. 3. Prerequisite: ENGR 440.

The senior engineering design courses I and II constitute a two-semester sequence of an interdisciplinary activity. The objective of these courses is to provide engineering students with experience in interdisciplinary engineering design. Application of the design process and practice in which students are assigned or select suitable projects. Students working in teams pursue an idea from conception to realistic design. The course is climaxed by a preparation of a substantial written report and a formal presentation before faculty and students.

ENGR 483. INTRODUCTION TO CONTROL SYSTEMS. Class 3, cr. 3. Prerequisite: ENGR 325.

Introduction to classical control theory. Review of Laplace Transforms, transfer functions, block diagram manipulation, time domain and S-plane characteristics. System stability. Root locus analysis and design. Bode analysis and design. Compensation. Introduction to state-space formulation.

ENGR 495. SELECTED TOPICS IN ENGINEERING. Cr. 1-6.

Available upon arrangement with the head of the department. May be repeated for credit.

ME 271. BASIC MECHANICS I (STATICS). Class 3, cr. 3. Prerequisite: PHYS 152. Corequisite: MA 261.

Review of vector algebra and equilibrium. Hydrostatics, virtual work, static stability, friction. First and second moments of areas, volumes and masses, center of gravity.

ME 275. BASIC MECHANICS II (DYNAMICS). Class 3, cr. 3. Prerequisites: MA 261, ME 271.

Fundamental concepts, kinematics, translation and rotation. Kinetics impulse, momentum, work, energy. Rectilinear and curvilinear translation of point masses. Plane motion of rigid bodies and vibration.

ME 305. GENERAL THERMODYNAMICS I. Class 3, cr. 3. Prerequisite: MA 261.

Properties of pure substances, work and heat, first and second laws of Theromodynamics, entropy, irreversibility and availability, power and refrigeration cycles, thermodynamic relations.

ME 306. GENERAL THERMODYNAMICS II. Class 3, cr. 3. Prerequisite: ME 305.

Continuation of ME 305. Thermodynamic properties, mixtures, thermochemistry and chemical equilibrium, cycles, introduction to statistical thermodynamics.

ME 312. FLUID MECHANICS. Class 3, cr. 3. Prerequisites: MA 262, ME 275. Corequisites: ME 305, ME 313.

Continuum, velocity field, fluid statics, basic conservation laws for systems and control volumes, dimensional analysis, Euler and Bernoulli equations, viscous flows, boundary lay, flow in channels and around submerged bodies, one-dimensional gas dynamics.

ME 313. FLUID MECHANICS LABORATORY. Lab. 3, cr. 1. Corequisites: ME 312, ME 345.

Introduction to fluid mechanics laboratory, experiments on flow patterns, velocity profile in an air pipe, wind tunnel calibration, draining of a tank, pipe friction, boundary layer studies, falling ball experiments, and viscosity measurements.

ME 320. KINEMATIC ANALYSIS AND DESIGN. Class 2, Lab. 3, cr. 3. Prerequisites: ME 275.

Graphical, analytical and computer techniques for analyzing displacements, velocities and accelerations in mechanisms. Analysis and design of linkages, cams and gears. Laboratory projects include analysis, design, construction and evaluation of mechanisms.

ME 345. MECHANICAL ENGINEERING EXPERIMENTATION. Class 2, Lab. 3, cr. 3. Prerequisites: CE 273, ENGR 325.

Mechanical measurements and methods of experimentation. Calibration standards, statistical replication and error minimization, transducers and instrumentation, dimensional analysis and the design of an experiment. Laboratory experiments will require formal reports and will deal with displacements, velocities, pressures and elastic strains.

ME 416. HEAT TRANSMISSION. Class 3, cr. 3. Prerequisite: ME 305, ME 312, ME 313.

Steady state and transient heat transfer by conduction, laminar and turbulent convection, film condensation and boiling, and by radiation. Combined heat and mass transfer by diffusion and convection. The analysis and design of heat exchangers for process heat transfer.

ME 417. HEAT TRANSMISSION LABORATORY. Lab. 3, cr. 1. Corequisite: ME 416.

Heat transmission laboratory with measurements of temperatures and flows. Experiments include temperature profiles in solids, thermal conductivity, radiation and the determination of various heat and mass transfer coefficients.

ME 418. AIR CONDITIONING SYSTEMS. Class 3, cr. 3. Prerequisite: ME 305.

Central systems for air conditioning. Total energy, heat recovery, and heat pump systems. Chilled hot water systems. Industrial ventilation, exhaust, and drying systems. Electric and infrared heating. Odor control. Economics. Refrigeration. Automatic controls.

ME 440. INTERNAL COMBUSTION ENGINES. Class 3, cr. 3. Prerequisite: ME 305.

Basic principles; theoretical and actual cycles; performance characteristics; combustion, carburetion; air capacity; fuels and lubricants; accessories and controls.

ME 461. MECHANICAL ENGINEERING DESIGN. Class 3, Lab. 3, cr. 4. Prerequisite: CE 273, ME 320.

Application of mechanics and mechanics of materials in design. Design of production machinery and consumer products considering fatigue and mechanical behavior. Selection and sizing of basic mechanical components. Laboratory includes a team design project.

ME 497. SELECTED TOPICS IN MECHANICAL ENGINEERING. Cr. 1-6.

Available upon arrangement with the head of the department. May be repeated for credit.

MSE 200. MATERIALS SCIENCE. Class 3, cr. 3. Prerequisite: CHM 115 or equivalent.

An introductory course designed to provide a basic background in the broad field of materials science. Emphasis placed on the chemical and physical principles underlying the utilization

and behavior of metals, alloys, ceramics, composites, and aggregates in engineering.

MSE 344. MATERIALS IN ENGINEERING. Class 2, Lab. 3, cr. 3. Prerequisite: MSE 200.

Introduction to the structure and mechanical and physical properties of Engineering materials. Selection of metals, alloys, plastics, ceramics and composites for engineering applications. Strengthening methods and environmental effects. Analysis of the failure of materials under load. Laboratory experiments include mechanical testing, metallography, thermal treatment and failure analysis.

MSE 385. NONDESTRUCTIVE TESTING. Class 3, cr. 3. Prerequisites: MSE 200, PHYS 261 or equivalent.

Basic principles and common applications of nondestructive testing methods. The laws of physics are used to evaluate mechanical and physical properties of materials. The NDT methods cover magnetic, penetrants, eddy current, ultrasonic, radiography and specialized methods.

DUAL LEVEL
(Undergraduate-Graduate)

A&AE 543. CONTINUUM MECHANICS I (ME 507). Sem. 1. Class 3, cr. 3. Must be preceded by ME 275 or equivalent.

Introduction to Cartesian tensors. Basic principles of continuum mechanics: concepts of deformation, motion, stress, and strain; conservation of mass, balance of momenta, continuum thermodynamics, and constitutive equations. Illustrative applications in elasticity, fluid dynamics, and viscoelasticity. Credit will not be given for both A&AE 543 and ME 507.

A&AE 544. CONTINUUM MECHANICS II (ME 508). Sem. 2. Class 3, cr. 3. Must be preceded by A&AE 543 or ME 507.

Continuation of A&AE 543 with further applications in theoretical and applied mechanics. Discussions on recent advances in the field of continuum physics. Credit will not be given for both A&AE 544 and ME 508.

A&AE 547. EXPERIMENTAL STRESS ANALYSIS. Class 2, Lab. 3, cr. 3. Admission by consent of instructor.

Theory and application of photoelastic, electric strain gage, and brittle lacquer methods of experimental stress analysis for static and dynamic loadings. Strain gage work will include strain rosettes.

CE 511. HISTORY OF URBAN PLANNING AND URBAN DESIGN. Sem. 1. Class 3, cr. 3.

A study of the layout and character of physical development of cities from ancient times to present day with reference to changing concepts of pattern and form; political and social relationships; and functions. The study includes early Greek and Roman cities, early American and European contributions, the Garden City movement, British new towns, planners, and their theories and examples of planned twentieth century cities.

CE 512. INTRODUCTION TO COMPREHENSIVE URBAN PLANNING. Class 3, cr. 3.

An introductory course which provides a framework for better understanding of the current urban planning process. Concepts and emerging trends are covered as well as an introduction into methods of techniques.

CE 570. ADVANCED STRUCTURAL MECHANICS. Class 3, cr. 3. Must be preceded by CE 273 and MA 262.

Flexure and torsion; energy methods, Castigliano's theorems, complementary energy theorem. Maxwell-Mohr method; indeterminate structural and machine members; ultimate load analysis of indeterminate members; beam columns and beam-tension members.

CE 574. INTRODUCTION TO STRUCTURAL RELIABILITY. Class 3, cr. 3. Must be preceded by MA 261 and CE 371, or equivalent.

Elements of probability theory and its application to structural engineering; statistical distributions of load; probable strength of structural elements and machine parts; safety analysis and reliability prediction of structural and mechanical systems; reliability-based designs.

CE 577. THEORY OF ELASTICITY, PLATES, AND SHELLS. Sem. 1. Class 3, cr. 3. Must be preceded by MA 262.

Two-dimensional elasticity theory and applications, classical analysis of circular and rectangular plates, analysis of thin cylindrical shells and shells of revolution.

CE 579. STRUCTURAL STABILITY. Class 3, cr. 3. Must be preceded by CE 472.

Bending of structural members subjected to axial and lateral loads; buckling of compression members and frames in elastic and inelastic ranges; local buckling; lateral buckling of beams; design criteria.

EE 518. INTRODUCTION TO AUTOMATIC CONTROL SYSTEMS. Class 3, cr. 3. Must be preceded by graduate standing. (Credit cannot be obtained for both EE 518 and ME 575.) Acceptable for credit in the Interdisciplinary Graduate Program in Engineering. Not offered on the West Lafayette Campus.

Mathematical modeling of a system. Linear systems analysis in the time and frequency domains. State variables and transfer functions. Stability, controllability and observability. Feedback control design techniques. Equalizer synthesis on Bode-Nyquist and root-locus diagrams. Analytic design and parameter optimization techniques.

EE 519. CONTROL THEORY II. Class 3, cr. 3. Must be preceded by EE 518. Acceptable for credit in the Interdisciplinary Graduate Program in Engineering. Not offered on the West Lafayette Campus.

The approximation of common nonlinearities by describing functions and the analysis of resultant system behavior. Review of matrix analysis. State-space formulation, representation, solution and design. Introduction to optimization and computational methods.

EE 525. ANALYSIS OF ELECTROMECHANICAL SYSTEMS I. Class 3, cr. 3. Must be preceded by EE 425 or graduate standing.

Modern analysis of synchronous and induction machines in electromechanical systems. The concept of multiple reference frames used to analyze unbalanced conditions. Computer simulations. Analysis of operating point stability and variable frequency drive systems.

EE 532. COMPUTATIONAL METHODS FOR POWER SYSTEM ANALYSIS. Class 3, cr. 3. Must be preceded by EE 432.

System modeling and matrix analysis of three-phase power networks. Applications of numerical methods and computers to the solution of a variety of problems related to the planning, design, and operation of electric power systems.

EE 554. ELECTRONIC INSTRUMENTATION AND CONTROL CIRCUITS. Class 3, cr. 3. Must be preceded by EE 255 and 301, or equivalent.

Analysis and design of special amplifiers, pulse circuits, operational circuits, d-c amplifiers, and transducers used in instrumentation, control and computation.

EE 595. SELECTED TOPICS IN ELECTRICAL ENGINEERING. Hours and credits to be arranged.

IE 530. QUALITY CONTROL. Class 3, cr. 3. Prerequisite: IE 330 or STAT 516 or equivalent.

Principles and practices of quality control in industry; administrative and engineering aspects of quality control programs; introduction to statistical quality control.

IE 532. RELIABILITY. Class 3, cr. 3. Must be preceded by IE 330 or STAT 516 or equivalent.

Reliability of components and multicomponent systems. Application of quantitative methods to the design and evaluation of engineering and industrial systems and of processes for assuring reliability of performance. Economic and manufacturing control activities related to product engineering aspects of reliability. Principles of maintainability. Produce failure and legal liability.

IE 535. LINEAR PROGRAMMING. SS. Sem. 1 and 2, Class 3, cr. 3. Must be preceded by IE 335 or equivalent.

Optimization of linear objective functions subject to linear constraints. Development of theory, algorithms, and applications of linear programming.

IE 536. STOCHASTIC MODELS IN OPERATIONS RESEARCH I. Sem. 1 and 2. Class 3, cr. 3. Must be preceded by IE 336 or equivalent.

An introduction to techniques for modeling random processes used in operations research. Markov chains, continuous time Markov processes, Markovian queues, reliability and inventory models.

IE 545. ENGINEERING ECONOMIC ANALYSIS. Class 3, cr. 3. Must be preceded by IE 335, or 436, and either 343 or 440, or equivalent.

Analysis of engineering costs and capital investments. Applications of classical optimization, mathematical programming, the theory of the firm,and the theory of production to the analysis of investment proposals. Evaluation and selection of individual projects and formulation of capital investment programs.

IE 546. ECONOMIC DECISIONS IN ENGINEERING. Class 3, cr. 3. Must be preceded by IE 336 or 436 and either 431 or 480 or equivalent.

Analytical models and techniques as applied to industrial problems of replacement, production, resource allocation and related problems involving probabilistic behavior. Emphasis is given to model assumptions, implications, input data, and other information at the operating level.

IE 558. SAFETY ENGINEERING. Class 3, cr. 3. Must be preceded by IE 386.

Application of human factors and engineering practice in accident prevention and the reduction of health hazards are presented. The objective of this course is to provide an understanding of the safety and health practices which fall within the responsibilities of the engineer in industry. Special attention is devoted to the detection and correction of hazards and to contemporary laws and enforcement on occupational safety and health.

IE 579. ADVANCED PRODUCTION CONTROL. Class 3, cr. 3. Must be preceded by IE 480 or 483 or equivalent.

Modern, quantitative, computer-oriented techniques of production planning and control considering deterministic and probabilistic models. Design of industrial production control systems using computer control.

IE 590. TOPICS IN INDUSTRIAL ENGINEERING. Credit and hours to be arranged.

Selected topics in industrial engineering for seniors and graduate students. May be repeated with permission of adviser.

ME 500. THERMODYNAMICS. Class 3, cr. 3. Prerequisite: ME 306.

The empirical, physical basis of the laws of thermodynamics. Formulation of the definitions and laws from the postulational approach.

Properties and relations between properties in homogeneous and heterogeneous systems. The criteria of equilibrium. Application to a variety of systems and problems; phase and reaction equilibrium.

ME 505. HEAT AND MASS TRANSFER. Class 3, cr. 3. Prerequisite: ME 416.

Heat conduction and mass diffusion in two and three dimensions with application of analytical, numerical, and analogical techniques; treatment of convective heat and mass transfer for internal and external flows by dimensional analysis, integral method, and use of analogies between heat, mass, and momentum transport; radiation heat transfer for surfaces and gases; selected topics including combined heat and mass transfer, two phase heat transfer, and high speed flow phenomena.

ME 509. INTERMEDIATE FLUID MECHANICS. Class 3, cr. 3. Prerequisite: ME 312.

Fluid properties, basic laws for a control volume, kinematics of fluid flow, dynamics of frictionless incompressible flow, basic hydrodynamics, equations of motion for viscous flow, viscous flow applications boundary layer theory, unsteady flow.

ME 510. GAS DYNAMICS. Class 3, cr. 3. Prerequisite: ME 312.

Flow of compressible fluids including one-dimensional gas dynamics, isentropic flow, normal and oblique shocks, and diabatic flow. Two-dimensional compressible flow including irrotational flow, linearized theory and method of characteristics. Shock reflection and interaction.

ME 513. ENGINEERING ACOUSTICS. Class 3, cr. 3.

The simple oscillator. Free and forced response. Applications to vibration isolation. Transient response. Applications to sonic boom excitation and spacecraft excitation by oscillating shocks. Wave motion in strings and bars. The acoustic wave equation. Sound transmission between two media and through walls. Building acoustics. Acoustic resonators and filters and applications to muffler theory.

ME 527. SOLAR ENERGY SYSTEMS. Sem. 2. Class 3, cr. 3. Must be preceded by undergraduate course in heat transfer.

Content fundamentals: Availability of solar energy. Spectral distribution of solar radiation. Thermal analysis of solar collectors. Thermal energy storage. Solar ponds. Concepts of solar-thermal energy systems. Heating and cooling; energy transport in solar systems. Controls for solar-thermal systems. Mathematical models of solar systems. Solar water heating. Liquid-based solar heating systems in buildings. Solar air heating systems. Solar heating economics. Solar space cooling. Advanced concepts and applications: solar desalination, stills, dehumidifcation. Solar thermal power systems. Collectors for high temperatures. Solar heat engines, solar-assisted heat pumps. Solar water pumps. Photovoltaic electric generation. Biological conversion systems. Photochemical systems.

ME 528. AIR POLLUTION. Class 3, cr. 3. Prerequisites: undergraduate thermodynamics and fluid mechanics or consent of instructor.

Definition of the air pollution problem. Kinds and sources of pollutants. Meteorology and the transport and movement of pollutants. Methods of controlling the quantities of dust, fumes, and mists generated in industrial processes. Aircraft, truck, and automobile exhausts and the pollution of the atmosphere. Biological and economic aspects of air pollution.

ME 530. DIRECT ENERGY CONVERSION. (EE 527) Class 3, cr. 3. Must be preceded by a first course in thermodynamics plus topics in elementary fluid mechanics and elementary electromagnetics (as available in minicourse form).

Energy sources; basic science of energy conversion; thermoelectric, thermionic, and magnetohydrodynamic systems; photovoltaic effects; solar cells and fuel cells.

ME 560. KINEMATICS. Class 3, cr. 3. Prerequisite: ME 320.

Geometry of constrained plane motion with applications to linkage design. Type and number synthesis, size synthesis. Graphical, analytical, and computer techniques.

ME 563. MECHANICAL VIBRATIONS. Class 3, cr. 3. Prerequisites: CE 273 and ENGR 325.

Review of systems with one degree of freedom including the LaPlace transformation. LaGrange's equations of motion for multiple degree of freedom systems. Transfer functions for harmonic response, impulse response, and step response. Convolution integrals for responses to arbitrary inputs. Principle frequencies and modes. Introduction to phase-plane for nonlinear problems. Applications to critical speeds, measuring instruments, isolation, torsional systems.

ME 568. SYSTEM OPTIMIZATION TECHNIQUES I. Class 3, cr. 3.

Development and application of concepts and techniques required for optimization of systems in which design freedom exists. ("Systems" may be aerospace, biological, economic, mechanical, etc.) Topics covered include dynamic programming, the Pontryagin Maximum Principle, interrelationships with the calculus of variations, solutions in the presence of system constraints. Introduction to direct techniques of solutions for both functional and parameter optimization problems. Computer solutions required.

ME 569. MECHANICAL BEHAVIOR OF MATERIALS. Class 3, cr. 3.

A study of how loading conditions and environmental conditions can influence the behavior of materials in service. Elastic and plastic behav-

ior, fracture, fatigue, low and high temperature behavior. Introduction to fracture mechanics. Emphasis is on methods of treating these conditions in design.

ME 571. LUBRICATION AND FLUID CUSHION SYSTEMS DESIGN. Class 3, cr. 3.

Boundary and thick film lubrication theory. Incompressible hydrostatic and hydrodynamic bearing systems. Elastohydrodynamic lubrication of rolling and rubbing elements. Mechanics of captured air bubble and hovercraft suspensions.

ME 580. NONLINEAR ENGINEERING SYSTEMS. Class 3, cr. 3.

Methods of analysis for nonlinear ordinary differential equations arising in engineering systems. Mathematical modeling. Exact and approximation solution techniques for nonlinear equations. Stability and graphical methods. Regular and singular perturbation anslysis. Variational methods and method of weighted residuals. Application of digital computers.

ME 587. ENGINEERING OPTICS. Class 3, cr. 3. (Laboratory work can be undertaken for additional credit by special arrangement.) Senior standing required.

Fundamentals of geometrical and physical optics as related to problems in engineering design and research. Characteristics of imaging systems; properties of light sources, optical properties of materials. Diffraction, interference, polarization, and scattering phenomena as related to optical measurement techniques. Introduction to lasers and holography.

ME 597. SELECTED TOPICS IN MECHANICAL ENGINEERING. Cr. 1-6. May be repeated for credit.

MSE 575. TRANSPORT PHENOMENA IN SOLIDS. Class 3, cr. 3. Must be preceded by senior standing in engineering or science.

Energetics and kinetics of phase changes in metals and alloys. Nucleation and growth models with special emphasis on role of crystal defects. Selected topics in multicomponent diffusion.

MSE 576. CORROSION. Class 3, cr. 3. Prerequisite or corequisite: CHM 373 or MSE 344.

Rate-controlling steps in electrode processes; activation, ohmic, and concentration polarization; passivation; potentiostatic studies and alloy design; application to engineering systems.

MSE 597. SELECTED TOPICS IN MATERIALS SCIENCE AND METALLURGICAL ENGINEERING. Hours and credits to be arranged.

MSE 597A. THE PHYSICAL CHEMISTRY OF IRON AND STEEL PRODUCTION. Class 3, cr. 3. Prerequisites: ME 305 and MSE 344 or equivalent.

A study of physical chemistry and thermodynamics applied to iron and steel production. Topics treated include metal-slag equilibria and the reactions of the important steelmaking elements.

MSE 597B. PHASE TRANSFORMATIONS AND PHYSICAL PROPERTIES. Class 3, cr. 3. Prerequisite: MSE 344 or equivalent.

A detailed study of recovery, recrystalization and grain growth in metals and alloys and the correlation of these solid state phenomena with the physical properties of the materials involved. Emphasis is placed on the theoretical principles involved and their industrial applications.

MSE 597D. MECHANICAL BEHAVIOR OF MATERIALS. Class 3, cr. 3. Prerequisite: MSE 344 or equivalent.

The elastic and plastic behavior of materials and correlation of these with structural properties. Performance of materials during industrial deformation processes and fracture.

NUCL 501. NUCLEAR ENGINEERING PRINCIPLES. Class 3, cr. 3. Prerequisite: graduate standing in engineering or consent of instructor.

A first course for the graduate students desiring a nuclear engineering sequence. Nuclear structure; nuclear radiations; neutron behavior while slowing down and diffusing; fast and thermal reactor theory; and control.

NUCL 502. NUCLEAR ENGINEERING SYSTEMS. Class 3, cr. 3. Prerequisite: NUCL 501 or equivalent.

Engineering aspects of nuclear power. Materials of construction; fuel and fuel cycles; heat removal; radiation shielding; economics; and nuclear power systems.

NUCL 510. NUCLEAR REACTOR THEORY I. Class 3, cr. 3. Prerequisite: NUCL 501 or equivalent.

Basic multigroup theory, neutron slowing down, classical calculation of multiplication constants, two-group theory, introduction to transport theory two-dimensional flux distributions, reactivity balance, basic reactor dynamics and control.

NUCL 520. RADIATION EFFECTS AND REACTOR MATERIALS. Class 3, cr. 3. Prerequisite: NUCL 501; corequisite: NUCL 502.

Introduction to radiation effects in solids and a survey of nuclear reactor materials. Radiation interaction mechanisms and effects on properties. Reactor material characteristics, selection criteria, testing, and economic considerations.

GRADUATE LEVEL

CE 675. FINITE ELEMENT ANALYSIS. Class 3, cr. 3. Must be preceded by CE 577 or 578 or consent of instructor.

Theoretical basis of the finite element method; elements for use in the solution of two- and three-dimensional stress problems, plate-bending problems and shell problems; static and dynamic loadings; vibration and stability problems; geometrical or material non-linearities; flow problems.

CE 677. THEORY AND DESIGN OF SHELLS. Class 3, cr. 3. Must be preceded by CE 577.

Analysis and design of shell structures such as cylindrical vaults, intersection shells, domes, warped or doubly curved roof structures, tanks, and folded, plate structures by classical, numerical, and approximate methods.

EE 600. RANDOM VARIABLES AND SIGNALS. Class 3, cr. 3. Prerequisite: EE 440 or 483 or graduate standing.

Engineering applications of probability theory. Problems on events, independence, random variables, distribution and density functions, expectations and characterisitc functions. Dependence, correlation, and regression; multivariate Gaussian distribution. Stochastic processes, stationary, ergodicity, correlation functions, spectral densities, random inputs to linear systems; Gaussian processes.

EE 602. LUMPED SYSTEM THEORY. Class 3, cr. 3. Prerequisite: EE 448 or 518 or graduate standing.

Basic methods of modern system theory. Time domain techniques for both linear and nonlinear systems. Characterization of both continuous and discrete-time linear systems in the time and frequency domains. Energy relationships and the restriction that positive energy storage places on physical systems.

EE 604. ELECTROMAGNETIC FIELD THEORY. Class 3, cr. 3. Prerequisite: EE 311 or graduate standing.

Review of general concepts, (Maxwell's equations, materials interaction, boundary conditions, energy flow), statics (LaPlace's equation, Poisson's equation, mapping), distributed parameter systems (classification of solutions, transmission lines and waveguide), radiation and antennas (arrays, reciprocity, Huygen's principle), a selected special topic (e.g., quantum electronics, plasmas, coupled modes, relativity).

EE 606. SOLID STATE AND MAGNETIC DEVICES. Class 3, cr. 3. Prerequisite: EE 402 or graduate standing.

A brief introduction to the theory of solids which is followed by the formulation of the equations of semiconductor devices. The P-N junction theory is formulated and solved for several differnt conditions illustrating a number of devices. The tunnel diode is studied as an example of tunneling. The transistor is presented with emphasis on microwave, power, switching, the SCR is studied in detail as well as the JFET. Other devices include the IGFET, charge-coupled, Schottky diode, I-C fabrication. Magnetic materials and devices are presented.

EE 608. FOUNDATIONS OF COMPUTER ENGINEERING. Class 3, cr. 3. Must be preceded by EE 369 or graduate standing.

Mini and micro computer organization including hard wired and micro programmed control units, interfacing requirements (software and hardware), using interrupt, automatic priority interrupt and direct memory access input/output systems. Data structures, including linked lists and binary trees, sorting and tree searching algorithms, Hashing.

Finite state machine models, decomposition of sequential machines, initial and terminal state identification and machine identification.

EE 654. DEVICE RELATED SEMICONDUCTOR PHENOMENA. Class 3, cr. 3. Must be preceded by EE 606.

Detailed examination and sample device application of semiconductor phenomena central to semiconductor device operation. Topics covered will be temperature dependence of fundamental parameters, recombination-generation statistics, noise, photo phenomena, and radiation effects.

EE 672. LINEAR PASSIVE NETWORK THEORY. Class 3, cr. 3. Must be preceded by EE 332 or graduate standing.

Passivity. Positive real functions. Synthesis of LC, RC, and RLC one-ports. Synthesis of RC two-ports, Synthesis of single-terminated and double-terminated lossless two-ports. Scattering matrices and applications to network synthesis.

EE 676. ACTIVE AND DIGITAL FILTERS. Class 3, cr. 3. Must be preceded by EE 602.

Filter design with active and digital hardware. Previous filters course helpful, but not necessary. Emphasis in active portion is on structures including the two-integrator loop, the Friend circuit, and "leap-frog" filter topologies. Also discussed in active filters are sensitivity, pole-zero pairing for higher-order filters, and op, amp, modeling. Digital portion of course will cover standard Z-transform, bilinear Zptransform, nonrecursive filter design, window functions, round off noise, limit cycles, aliasing, A/D's, D/A's, and music synthesis. A recently completed digital filter laboratory allows the quick construction and testing of real-time digital filters of high order. Several hardware filters will be built, as will be a small real-time orchestra.

EE 680. INTRODUCTION TO MODERN CONTROL THEORY. Class 3, cr. 3. Must be preceded by EE 602 or EE 518.

Discussion of basic theoretical methods in modern control theory. Topics include parameter optimization techniques, maximum principle

and dynamic programming approaches to optimal control problems, second variation technique and sufficient conditions, singular control and introduction to adaptive control.

EE 685. DIGITAL PROCESS CONTROL AND MATHEMATICAL MODELING OF INDUSTRIAL SYSTEMS. Class 3, cr. 3. Prerequisite: EE 518 or equivalent.

This course describes the present status of automatic control in industry with emphasis on the application of digital control. Problems involved in the use of both supervisory and direct digital control systems will be presented and the development of mathematical models will also be covered.

ME 614. ADVANCED GAS DYNAMICS. Class 3, cr. 3. Must be preceded by a first course in gas dynamics.

Advanced concepts in compressible fluid flow, including bondary layers, subsonic, transonic, and supersonic flows. Applications of the method of characteristics, the method of integral relations, and fixed grid finite differences. Study of nonequilibrium, chemically reacting flow including questions of sound propagation, characteristics theory, entropy and vorticity generation, and shock waves.

ME 660. ADVANCED KINEMATICS. Sem. 2. Class 3, cr. 3. Must be preceded by ME 560.

Geometry of constrained motion in three dimensions; applications to the design of mechanisms.

ME 664. VIBRATIONS OF CONTINUOUS SYSTEMS. Class 3, cr. 3. Must be preceded by knowledge of one degree of freedom system vibrations.

Theory of small oscillations of continuous systems. Love's equations for thin shells, reduction to special cases of shallow shells, plates, beams, etc. Initial stresses; influence of shear; thermal excitation. Initial value problems; forced vibrations; structural damping. The dynamic Green's function, impedance concepts; variational approaches. Experimental procedures, scaling, composite, and stiffened shells.

INDUSTRIAL ENGINEERING TECHNOLOGY — See Department of Manufacturing Engineering Technologies and Supervision

INDUSTRIAL EDUCATION — See Department of Manufacturing Engineering Technologies and Supervision

INDUSTRIAL MANAGEMENT — See Department of Management

DEPARTMENT OF INFORMATION SYSTEMS & COMPUTER PROGRAMMING

A. J. Adams, Head

FACULTY: A.J. Adams, D.R. Kurtz, J. Maniotes, J.S. Quasney, S. Rados (Radosavljevic), N.J. Smith, R.H. Untch

ASSOCIATE IN APPLIED SCIENCE DEGREE (COMPUTER PROGRAMMING)

This two-year Associate degree program is designed to produce a graduate in the occupational group that begins with the computer programmer.

This curriculum is designed to prepare a person to perform the following functions: analyze problems initially presented by a systems analyst with respect to the type and extent of commercial or scientific data to be processed, the method of processing to be employed, and the format and extent of the final results; design detailed flowcharts and computer programs giving the computations involved and the sequences of computer and other machine operations necessary to edit and input the data, process it, edit and output information; correct program errors and determine the causes of processing interruption; verify the accuracy and completeness of computer programs by preparing sample data and testing it on the computer; evaluate and modify existing programs to take into account changed requirements; confer with technical personnel with respect to planning new or altered programs; prepare full documentation with respect to procedures on the computer and other machines and on the content of the computer

programs and their full usage; devise more efficient methods for the solution of commercial or scientific problems; comprehend the major concepts, types of equipment, and programming systems related to electronic data processing; be familiar with common commercial and business procedures or with common scientific and engineering procedures.

Those who wish may continue on with the Baccalaureate program without loss of time, credit or change of direction.

Plan of Study

FRESHMAN YEAR

First Semester

(5) CIS 115 (Introduction to Data Processing)
(3) ENGL 104B (English Composition I)
(3) ECON 210 (Principles of Economics)
(3) MA 153 (Algebra & Trigonometry I)
(3) Elective
—
(17)

Second Semester

(3) COM 115 (Fundamentals of Public Speaking)
(4) CIS 133 (Assembly Language Programming I)
(3) CIS 260 (Structured Programming)
(3) ENGL 220 (Technical Report Writing)
(3) Social Science Elective
—
(16)

SOPHOMORE YEAR

Third Semester

(3) CIS 286 (Computer Operating Systems I)
(3) MA 213 (Finite Mathematics I)
(3) CIS 252 (Systems Analysis and Design)
(3) CIS 265 (COBOL Programming)
(3) MGMT 200 (Introduction to Accounting)
—
(15)

Fourth Semester

(3) CIS 365 (Topics in COBOL)
(2) CIS 294 (Data Processing Seminar)
(3) MA 214 (Finite Mathematics II)
(3) MGMT 201 (Cost Accounting)
(3) Elective
And Choose *ONE* of the Following:
(3) CIS 233 (Advanced Assembler)
(3) CIS 261 (RPG Programming)
(3) CIS 264 (FORTRAN Programming)
—
(17)

(65) Total Credits

BACHELOR OF SCIENCE DEGREE (COMPUTER PROGRAMMING)

Introduction

The Baccalaureate program is a two-year "add-on" curriculum which is open to Associate Degree graduates in Information Systems & Computer Programming with good academic records.

The program builds on the student's knowledge of computer programming acquired in the first two years and emphasizes the practical aspects of computer systems design and commercial systems analysis. The inclusion of many elective courses enables the student to pursue areas of special interest.

Graduates are prepared to fill a variety of positions in the computer programming and systems analysis area. The objective is to prepare a student to become employed as an entry level systems analyst.

Beginning in the Fall Semester 1980, five alternative plans of study were made available to students pursuing the bachelor of science degree. Four of these are the management minor, the accounting minor, the marketing minor and the finance minor. The fifth plan of study parallels the previous 3rd and 4th year offerings and is designated as the commercial option. Three additional plans of study in systems programming, software services and a technical option will be offered in the near future.

GENERAL REQUIREMENTS

1. Completion of an Associate in Applied Science Degree in Information Systems and Computer Programming with a good academic record, or the equivalent.
2. Completion of the Core Requirements, plus additional courses as required to complete a minimum of 129 semester credit hours (which includes credits earned toward the Associate Degree).
3. A minimum of 40 semester credit hours must be 300 or higher level courses.

RECOMMENDED PLANS OF STUDY

JUNIOR YEAR
Fifth Semester

(3) CIS Elective (per advisor)
(3) CIS 386 (Computer Operating Systems II)**
(3) ECON 251 (Microeconomics)
(4) PHYS 270G (General Physics)
(3) Optional Course (see next column)
—
(16)

Management
(3) MGMT 310 (Financial Management)*
Accounting
(3) MGMT 300 (Financial Accounting I)
Marketing
(3) MGMT 300 (Financial Accounting I)
Finance
(3) MGMT 300 (Financial Accounting I)
Commercial
(3) MGMT 300 (Financial Accounting I)

*MGMT 300 is recommended as a previous course.
**CIS 233 prerequisite.

Sixth Semester

(3) MGMT 302 (Business Statistics)
(3) CIS 340 (Data Communications)
(3) CIS 360 (PL/1 Programming)
(3) ENGL 422 (Industrial Writing)
or
(3) ENGL 420 (Business Writing; General Applications)
(6) Optional Courses (see next column)
—
(18)

Management
(3) MGMT 324 (Marketing Management)
(3) MGMT 430 (Labor Relations)
Accounting
(3) MGMT 590A (Accounting Concepts Theory)
(3) MGMT 503 (Advanced Accounting)
Marketing
(3) MGMT 324 (Marketing Management)
(3) SOC 416 (Industrial Sociology)
Finance
(3) MGMT 310 (Financial Management)
(3) MGMT 516 (Investment Management)
Commercial
(3) SPV 374 (Elements of Supervision)
(3) Elective

SENIOR YEAR
Seventh Semester

(3) CIS 453 (Data Base Management)
(3) CIS 480 (Computer Systems Planning)
(3) CIS 452 (Management Information Systems I)
(3) Social Science Elective
(3) Optional Course (see next column)
—
(15)

Management
(3) MGMT 455 (Legal Background in Business)
Accounting
(3) MGMT 505 (Management Accounting II)
Marketing
(3) MGMT 425 (Marketing Planning and Research)
Finance
(3) MGMT 512 (Money & Capital Markets)
Commercial
(3) MGMT 455 (Legal Background in Business)

Eighth Semester

(3) CIS 454 (Management Information Systems II)
(3) CIS 485 (Topics in ISCP)
(3) Humanities Elective
(6) Optional Courses (see next column)
—
(15)

Management
(3) MGMT 450 (Business Policy)
(3) MGMT 461 (Management of Operations)
Accounting
(3) MGMT 506 (Auditing)
(3) MGMT 504 (Federal Income Tax)
Marketing
(3) MGMT 583 (Small Business Management)
(3) PSY 585 (Psychological Foundations of Consumer Behavior)
Finance
(3) MGMT 583 (Small Business Management)
(3) MGMT 450 (Business Policy)
Commercial
(3) EE 409 (Engineering Economy) *or* IET 450 (Production Cost Analysis)
(3) Elective

INFORMATION SYSTEMS & COMPUTER PROGRAMMING

PERSONAL SERVICE COURSES

Students successfully completing personal service courses numbered 1 through 90 earn certificate units and not University credit.

CIS 64. INTRODUCTION TO COMPUTER PROGRAMMING. Class 1, Lab. 1, cert. units 1.

The writing of programs to solve problems on the computer in the language FORTRAN. The laboratory period is used to process programs through the computer.

UNDERGRADUATE LEVEL

Lower-Division Courses

CIS 100. COMPUTER UTILIZATION. Class 3, cr. 3.

An introduction to data processing techniques through the use of high-speed computer equipment. Emphasis will be on how computers can assist the potential user. Students will be introduced to BASIC and will be expected to develop a minimal level of proficiency in using this language on a MINI or MICRO computer.

CIS 115. INTRODUCTION TO DATA PROCESSING. Class 4, Lab. 2, cr. 5. Not open to students with credit in CIS 116 or CIS 117.

An introduction to computers and data processing. Theory and applications of electronic data processing equipment are discussed including historical development, unit record equipment, stored program concepts, input/output media, flow-charting, programming and terminals.

CIS 116. INTRODUCTION TO DATA PROCESSING I. Class 3, cr. 3. CIS 116-117 is a two semester version of CIS 115. Not open to students with credit in CIS 115.

CIS 117. INTRODUCTION TO DATA PROCESSING II. Class 2, Lab. 2, cr. 3. Continuation of CIS 116. Not open to students with credit in CIS 115.

CIS 122. COMPUTER MATH. Class 3, cr. 3. Corequisite: MA 147.

Selected topics in mathematics that are related to business and computer computations. Topics include symbolic logic; binary octal, and hex-

adecimal number systems; determinates; matrices; and linear systems.

CIS 133. ASSEMBLY LANGUAGE PROGRAMMING I. Class 3, Lab. 2, cr. 4. Prerequisites: CIS 115 or CIS 116 or equivalent.

Programming of a digital computer at the machine language and assembly language levels with emphasis on the meticulous step by step development of a program. Topics include: computer hardware, stored program concepts, operation codes, addresses, flow diagrams and assembly language translators. In the laboratory, students write, process, and debug programs using the IBM 370/130 computer.

CIS 198. DATA PROCESSING PRACTICE I. Cr. 1.

Practice in industry with written reports of this practice for co-op students. May be repeated once. Requires consent of department head.

CIS 200. COMPUTER PROGRAMMING FUNDAMENTALS. Class 3 or Class 2, Lab. 2, cr. 3.

The presentation of the basic elements of programming digital computers. There are practical problems in student's major area provided for lab exercises. Major emphasis will be on compiler language (FORTRAN) programming. Not open to ISCP majors.

CIS 205. INTRODUCTION TO BUSINESS DATA PROCESSING. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Not for ISCP Majors.

An integrated approach to management information systems. Topics covered will include computer hardware concepts, computer software programming languages, system design concept and an exploration of the structure of computer-oriented business systems in operation today. An introduction to programming in the COBOL language will be provided in course.

CIS 233. ADVANCED ASSEMBLER. Class 2, Lab. 2, cr. 3. Prerequisite: CIS 131 or CIS 133.

Advanced symbolic programming techniques, programming exercises, and case studies are designed to familiarize the student with actual programming practices and to bridge the gap from the theoretical to the real world of data processing. IBM S/360-370 assembler language is emphasized, with MACRO language introduced in the latter stages of the course.

CIS 252. SYSTEMS ANALYSIS AND DESIGN. Class 3, cr. 3. Prerequisite: 115, corequisite CIS 261 or equivalent.

This course introduces the programmer to the procedural requirements of the system cycle. Through actual problem solution, the student is introduced to the techniques of system planning, analysis form and file design, documentation, implementation and evaluation.

CIS 254. COMMERCIAL SYSTEMS APPLICATIONS. Class 3, or Class 2; Lab. 2, cr. 3. Prerequisite: CIS 252.

An introduction to key business data processing applications covering inputs, the main programs and files used in the applications, special processing and maintenance requirements, documents and reports resulting from the processes and the interrelationship between computer applications. Applications areas include payroll, order processing, accounts receivable, inventory control, accounts payable, etc.

CIS 260. STRUCTURED PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: CIS 115 (or equivalent).

Introduction to a version of structured programming using a dialect of PL/1 or PASCAL which enforces good programming practices and provides formal verification of the correctness of programs. Desirable programming practices which are required for a student to serve a firm foundation for future programming courses and career are emphasized. Extensive laboratory exercises are assigned.

CIS 261. RPG PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: CIS 115 or equivalent.

Computer programming using RPG I and II Report Program Generator. Study of the language structure, applications, and related utility programs.

CIS 264. FORTRAN PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: CIS 115.

The structure and details of FORTRAN, a mathematically oriented compiler language. Numerous problems are solved on the computer to demonstrate and develop confidence in the many facets of the language.

CIS 265. COBOL PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: a prior programming course.

A study of the programming language, ANS COBOL, which is oriented toward data handling and processing tasks. The student will study the structure and details of COBOL and perform programming exercises dealing with practical applications.

CIS 286. COMPUTER OPERATING SYSTEMS I. Class 2, Lab. 2, cr. 3. Prerequisites: CIS 133, 233.

An introduction to the computer operating systems and other systems software. Topics include: Supervisor organization, utility programs, job control language, program supervisor macros, loaders and link-editors.

CIS 288. DATA STORAGE AND ACCESS METHODS. Class 3, cr. 3. Prerequisite: CIS 133.

File-handling topics (emphasis on common data bases and large disk files) in regards to the mechanical efficiency of file organization including input/output control systems, over-

lapped input/output, data channels, data storage structures, blocking chaining, hooking, data areas, file reorganization, timing considerations, and data base organization.

CIS 290. COMPUTER PROJECT. Cr. 1-4. Prerequisite: Consent of department head.

Independent study for sophomore students who desire to execute a complete computer-oriented project. Course may be repeated for credit up to six hours.

CIS 294. DATA PROCESSING SEMINAR. Class 3, cr. 2. Prerequisite: CIS 115 or equivalent.

Current problems and issues in the computer field. Field trips are required.

CIS 298. DATA PROCESSING PRACTICE II. Cr. 1. Prerequisite: Consent of department head.

Practice in industry with written reports of this practice for co-op students. May be repeated once.

CIS 299. INFORMATION SYSTEMS AND COMPUTER PROGRAMMING. Cr. 1-4.

Hours, credit and subject matter to be arranged by staff. May be repeated for credit up to nine hours.

UNDERGRADUATE LEVEL

Upper-Division Courses

CIS 300. INTRODUCTION TO COMPUTERS. Class 3, cr. 3. Not for ICSP Majors.

A broad survey of computers, data processing and applications. Punched card preparation, computer hardware, and programming principles and languages. Applications emphasize how the computer is used as a tool to assist the user.

CIS 303. INTRODUCTION TO BASIC PROGRAMMING. Class 2, Lab. 2, cr. 3. Not for ISCP majors.

An introduction to flowcharting and programming in the BASIC language for undergraduates in humanities, social sciences, education, industrial management, engineering, and technology. Use of BASIC in conversational and other modes for symbolic and numeric oriented problems.

CIS 305. INTRODUCTION TO COBOL PROGRAMMING. Class 2, Lab. 2, cr. 3, or Class 3, cr. 3. (Not for ISCP majors or for students with credit in CIS 205.)

An introduction to flowcharting and programming in the COBOL language for undergraduates in mathematics and science. Practical business data processing exercises offered will involve planning and writing COBOL programs and execution of these programs on various kinds of electronic digital computers.

CIS 340. DATA COMMUNICATIONS. Class 3, cr. 3. Prerequisite: CIS 233.

The role of data communications in modern computation. Real time systems and data transmission. Topics include: terminal equipment, communication media, data codes, error detection and correction, and terminal software.

CIS 345. COMPUTER GRAPHICS. Class 2, cr. 2. Prerequisite: An introductory computer course.

A survey of computer hardware used to make graphic displays including printers, plotter, and cathode ray tubes. Programming techniques for plotting lines and special symbols, the organization and representation of data, and a survey of applications.

CIS 360. PL/1 PROGRAMMING. Class 3, cr. 3. Prerequisites: CIS 260 and 265.

Detailed study of the PL/I programming language and comparison of the language with COBOL and FORTRAN. Students will program representative applications in the PL/1 programming language.

CIS 364. TOPICS IN FORTRAN. Class 3, cr. 3. Prerequisite: CIS 264.

A continuation of CIS 264. Dialects of FORTRAN with emphasis on FORTRAN IV, FORTRAN compilers, computational methods, and applications in various technical and commercial areas.

CIS 365. TOPICS IN COBOL. Class 3, cr. 3. Prerequisite: CIS 265.

Advanced COBOL topics concerning index-sequential files, direct files, sophisticated table handling employing subscripting and indexing, preprocessor use, simulation and subprogram use.

CIS 367. APL PROGRAMMING. Class 3, cr. 3. or Class 2, Lab. 2, cr. 3. Prerequisite: CIS 260.

Computer programming using APL, A programming language (Iverson). Study of the language structure and applications.

CIS 380. SYSTEMS OF COMPUTER APPLICATIONS. Class 3, cr. 3. Prerequisite: CIS 254.

Total computerization of various applications. Case studies will be used to reinforce those systems analysis techniques presented.

CIS 386. COMPUTER OPERATING SYSTEMS II. Class 2, Lab. 2, cr. 3. Prerequisites: CIS 286 and CIS 233.

A continuation of CIS 286 with emphasis on systems generation, control languages, and systems software.

CIS 396. COMPUTER LABORATORY. Lab. 1-6. cr. 1-2.

Applied computer laboratory experiences carried out on an independent study basis in conjunction with other courses, assignments, or problems.

CIS 398. DATA PROCESSING PRACTICE III. Cr. 1.

Practice in industry with written reports of this practice for co-op students. May be repeated once. Requires consent of department head.

CIS 440. INTRODUCTION TO MINI AND MICRO-COMPUTERS. Class 2, Lab. 2, cr. 3. or Class 3, cr. 3. Prerequisites: An introductory course in assembly language and a course in Physics or consent of department head.

An introduction to minicomputers, microprocessors and microcomputers. Basic elements of mini/microprocessor system. Mini/micro system development in a survey of current available hardware. Considerations in implementing mini/micro systems in process control, message switching, and on-line systems.

CIS 444. HYBRID COMPUTING SYSTEMS. Class 2, Lab. 2, cr. 3. Prerequisite: CIS 340.

A study of analog and hybrid computing systems. Topics will include: analog to digital and digital to analog conversion, process control systems, realtime monitoring.

CIS 452. MANAGEMENT INFORMATION SYSTEMS I. Class 3, or Class 2, Lab. 2, cr. 3. Prerequisites: CIS 254 and CIS 365.

The organization and processing of data in an integrated management information systems environment with emphasis on the source, flow organization, dissemination and interrelationship of data required for various operational areas of an industrial organization. Data base concepts are emphasized.

CIS 453. DATA BASE MANAGEMENT SYSTEMS. Class 3, cr. 3. Prerequisites: CIS 360 and CIS 365.

An introduction to logical and physical data structures, data base design, design objectives and commercial data-base management systems. Hierarchical, Network and Relational models are introduced along with such concepts as query languages, data dictionaries and distributed networks.

CIS 454. MANAGEMENT INFORMATION SYSTEMS II. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisites: Statistics and some compiler language.

A continuation of the material presented in CIS 452, including topics in operations research. Students will apply manual and programming techniques to solve simulations, integer, zero-one, linear programming, waiting line, and other types of problems.

CIS 460. PROGRAMMING SYSTEMS. Class 3, cr. 3. Prerequisites: CIS 260, 265, 360.

A broad overview of some basic and advanced concepts in higher level languages and their design. Emphasis is on issues and breadth rather than on details. Topics cover basic characteristics of programming languages, formal methods of defining syntax and semantics, broad language areas of string and list processing, formula manipulation on-line commands, simulation, concepts of languages for specialized application areas and for program validation, and current research topics and technical issues.

CIS 480. COMPUTER SYSTEMS PLANNING. Class 3, cr. 3. Prerequisites: CIS 452 and CIS 460.

The planning and design of computer systems, including the formulation of corporate requirements, configuration of hardware to satisfy stated requirements, comparison and evaluation of equipment, installation considerations and implementation procedures.

CIS 485. TOPICS IN INFORMATION SYSTEMS AND COMPUTER PROGRAMMING. Class 3, cr. 3.

Final semester course to acquaint students with the "State-of-the-art". Special guest lecturers, field trips and one to several-session series lectures are utilized to cover pertinent topics.

CIS 486. SYSTEMS PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: CIS 386.

Programming and maintenance of software packages. Software areas to be covered include operating systems, sub-routine sets, assemblers and compilers, microprogramming.

CIS 490. SENIOR PROJECT. Cr. 1-4. Prerequisite: Consent of department head.

Independent study for seniors who desire to execute a complete computer oriented project. Course may be repeated for credit up to six hours.

CIS 497. COMPUTER AND INFORMATION SYSTEMS. cr. 1-4.

Hours, credit, and subject matter to be arranged by staff. May be repeated for credit up to six hours.

CIS 498. DATA PROCESSING PRACTICE IV. Cr. 1.

Practice in industry with written reports of this practice for co-op students. May be repeated once. Requires consent of department head.

DEPARTMENT OF MANAGEMENT

E. Eugene Engle, Head

FACULTY: C.W. Anderson, C.J. Coolidge, P.H. Empey, E.E. Engle, J.M. Furdek, F.D. Hays (Emeritus), R. Hoadley, M. Jain, E.J. Jennings, G. Jocius, A. Lindskog, M.M. McGlinchy, K. Pogach, O.R. Reynolds, L.F. Smith, R.S. Weisler (Emeritus).

BACHELOR OF SCIENCE DEGREE (MANAGEMENT)

The general management curriculum provides a coordinated series of courses in the field of economics and business as a means of developing a broad fundamental background in business organization and the economic environment in which a business operates. The program includes four two-semester sequences covering economic principles, aggregative economics, statistics, and accounting, plus courses in business law and managerial economics. In addition, four related courses in economics and business, of special interest to our students, make possible a degree in specialization. Elective hours permit either further concentration in economics or enrichment in the general education area.

Business leaders, employment officials, and schools for advanced study, such as law schools, have endorsed this type of economics and business education with a liberal arts background. The program satisfies the need of future junior business executives for a broad, liberal-arts-oriented basis on which to build specific training and experience received on the job.

(Minimum credits for degree: 123)

FRESHMAN YEAR

First Semester

(3) COM 115 (Fundamentals of Public Speaking)
(3) ENGL 104B (English Composition I)
(3) General education group I elective†
(3) Lab science I elective*
(3) MA 153 (Algebra and Trigonometry I)
(1) MGMT 100 (Management Lectures)

(16)

Second Semester

(3) ECON 210 (Principles of Economics)
(3) ENGL 105 (English Composition)
(3) General education group I elective†
(3) Lab science II elective*
(3) CIS 205 (Data Processing)
(3) Elective

(18)

SOPHOMORE YEAR

Third Semester

(3) MA 213 (Finite Mathematics I)
(3) ECON 251 (Microeconomics)
(3) General education group I elective†
(3) ORGB 330 (Behavioral Sciences)
(3) MGMT 200 (Introduction Accounting)

(15)

Fourth Semester

(3) ECON 352 (Intermediate Macroeconomics)
(3) MGMT 201 (Cost Accounting)
(3) MA 214 (Finite Mathematics II)
(3) General Education group II†
(3) General Education I†

(15)

*, †: See Foornotes on next page.

JUNIOR YEAR

Fifth Semester

(3) General education group II elective†
(3) ENGL 420 Business Writing
(3) MGMT 302 (Business Statistics)
(3) MGMT 310 (Financial Management)
(3) MGMT 300 (Financial Accounting)

(15)

Sixth Semester

(3) General education group III elective†
(3) MGMT 461 (Managerial Policy)
(3) MGMT 430 (Labor Relations)
(3) Management option
(3) Elective

(15)

SENIOR YEAR

Seventh Semester

(3) MGMT 324 (Marketing Management)
(3) General education group III
(3) MGMT 455 (Legal Background in Business)
(3) Management option
(3) Elective

(15)

Eighth Semester

(3) MGMT 450 (Business Policy)
(6) Management option
(3) ECON Elective
(3) Elective

(15)

*LABORATORY SCIENCE: Completion of any two semesters (6 hours minimum) in the following subject(s):
Biology — 101, 102, 108, 109;
Chemistry — 111, 112, 115, 116, 131, 132;
Physics — 152, 218, 219, 220, 221;
Geoscience — 220, 361

†*GENERAL EDUCATION* — Requirements consist of: GROUP I — taking one of four-course sequence (not GS or Fine Arts) (Basic courses plus advanced courses. Suggested basic courses listed below.) GROUPS II and III — two two-course sequences (to include PSY 120 and 570). If selected for GROUP I, must include PSY 120 and 570 plus two additional psychology courses; GROUP IV — English 420. The areas for selection and basic courses are:

1. American History — HIST 151, 152
**2. Anthropology — ANTH 105, 204
3. English Literature — ENGL 230 or 238 and ENGL 231
**4. Fine Arts — A & D 355 or MUS 250 or THTR 201
5. Modern Languages — FR 101, 102, 203, 204
6. Modern Languages — GER 101, 102, 203, 204
7. Modern Languages — SPAN 101, 102, 203, 204
8. Philosophy — PHIL 110 or 111
9. Political Science, American — POL 101
10. Political Science, International — POL 141 and 230
11. Psychology — PSY 120, 570
12. Sociology — SOC 100, 220
13. World History, HIST 102, 103, 104
14. World Literature, ENGL 240, 241

ECONOMIC ELECTIVES — 525, 530, 534, 535, 551, 560, 570, 585
MANAGEMENT OPTION consists of four courses taken from one of the following:

			Accounting
MGMT	503	Accounting Problems	MGMT 506 Auditing
MGMT	504	Tax Accounting	MGMT 590A Accounting Concepts and Theory
MGMT	505	Management Accounting II	
			Finance
***MGMT	512	Financial Institutions and Markets	MGMT 583 Small Business Management
***MGMT	516	Investment Management	MGMT 503 Accounting Problems
			Labor
MGMT	431	Personnel Relations	PSY 570 Industrial Psychology
MGMT	553	Labor Law	PSY 572 Organizational Psychology
			Marketing
MGMT	425	Marketing Planning and Research	PSY 585 Psychological Foundations of Consumer Behavior
MGMT	583	Small Business Management	
*MGMT	584	New Enterprises	SOC 416 Industrial Sociology

Economics

ECON	525	Government and the Economy	ECON	551	Manpower Resources
ECON	530	Money and Finance	ECON	560	The Economics of Health
ECON	534	International Trade Theory	ECON	570	Transportation Economics
ECON	535	Current World Economic Problems	ECON	585	The United States and the World Economy in Recent Times

*A public speaking course is required.
**Cannot be used as a four course sequence.
***MGMT 512 Not open to students with credit in MGMT 412
MGMT 516 Not open to students with credit in MGMT 445
MGMT 584 Not open to students with credit in MGMT 583

ASSOCIATE IN MANAGEMENT DEGREE

The Associate Degree program in management is designed for those students who begin their college education with the goal of the bachelor's degree but who decides that they are unable to complete it.

The following provisions are applicable to this degree program:

1. The associate degree requires a minimum of 69 semester hours with one semester or equivalent with substantial occupational emphasis.
2. Student's have to declare their intention for the associate degree prior to registering for the career sequence.
3. The Management Department will provide comprehensive counseling in the development of the career sequence.
4. All courses involved in the associate degree curricula will be acceptable for credit toward four-year programs if taken in a normal sequence and program.

ECONOMICS

UNDERGRADUATE LEVEL

ECON 210 PRINCIPLES OF ECONOMICS. Class 3, cr. 3.

Study of the basic economic institutions and the role they play in defining and achieving the nation's economic goals. Emphasis will be placed on the interdependent nature of the economy and the effects of economic discussions on the individual and society.

ECON 211. CONTEMPORARY ECONOMIC PROBLEMS. Class 3, cr. 3. Prerequisites: ECON 210.

Economic analyses of a number of problems such as pollution, poverty, regional economics, economics of education, economic stability, and development economics.

ECON 217. ECONOMICS. Class 3, cr. 3.

National economic problems such as unemployment, recessions, inflation, taxation, bank interest rates, the growth of government, gold leaving the country, and a rising national debt are discussed along with the principles, policies, and institutions for solving these macroeconomic problems.

ECON 219. THE MEANING OF ECONOMICS (INTRODUCTORY) — FOR FUTURE TEACHERS. Class 3, cr. 3.

Structure and functioning of the American economic system, with emphasis upon the theory of the general levels of income, production, employment, and prices. Applications of economic knowledge as a tool for curriculum building and applications of the content of the course to the teaching of social sciences in the elementary and secondary school.

ECON 239. THE ROLE OF BLACKS IN AMERICAN ECONOMIC SOCIETY. Class 3, cr. 3.

Survey of the changing roles of Blacks in the American economy. Topics will include the slave economy, emancipation and the emergence of sharecropping after the Civil War, the Black migration to the North and the rise of the northern Black ghetto, the economics of discrimination, and other problems of Blacks in the labor market of modern capitalist society.

ECON 251. MICROECONOMICS. Class 3, cr. 3. Prerequisite: ECON 210.

Price theory and resource allocation. Emphasis is on developing a detailed understanding of the principles of microeconomics and analysis and their application to understanding price and market behavior.

ECON 252. MACROECONOMICS. Class 3, cr. 3. Prerequisite: ECON 251.

Financial behavior of households, non-financial business, commercial banks, and other financial institutions. The determination of interest rates and financial flows, the effect of these on economic activity, and the special role of the federal reserve.

ECON 352. INTERMEDIATE MACROECONOMICS. Class 3, cr. 3. Prerequisites: ECON 210 and 251.

Macroeconomic behavior. The determinants of consumption, investment, and the aggregate demand for assets. The joint determination of income, the price level, and the rate of interest. The role of government. Elements of economic growth.

ECON 375. UNITED STATES ECONOMIC HISTORY. Class 3, cr. 3. Prerequisite: ECON 210.

A study of the growth of the American economy from colonial times to the late nineteenth century. Emphasis is placed on the application of the tools of economic analysis to historical questions concerning the sources and rate of growth, the relationships between growth and structural and institutional change, and the impact of industrialization of the quality of life in the American economy.

ECON 415. CONTEMPORARY ECONOMIC PROBLEMS AND POLICIES. Class 3, cr. 3. Prerequisite: ECON 251.

A study of economic policies designed to improve the attainment of economic goals. Emphasis is placed on the examination of the relationship between private decision making and public policy in such areas as health care, transportation, environmental protection, and income distribution.

ECON 419. MANAGERIAL ECONOMICS. Class 3, cr. 3. Prerequisite: ECON 212 or 251.

The application of economic analysis and common nonmathematical models to concrete business decisions, such as capital acquisition and replacement, optimum inventory, and pricing. Linear programming is considered.

ECON 425. GOVERNMENT AND BUSINESS. Class 3, cr. 3. Prerequisite: ECON 210, 213, or 217.

Basic problems of governmental control and regulations of business, with emphasis on regulation through administrative agencies, taxation and fiscal policy, and the antitrust laws.

ECON 434. INTERNATIONAL TRADE. Class 3, cr. 3. Prerequisite: ECON 210 or permission of instructor.

Comparative advantage (why countries trade). The effects of tariffs, customs unions (the Common Market). The balance of payments.

ECON 456. ECONOMICS OF THE CITY. Class 3, cr. 3. Prerequisites: ECON 251 and MGMT 302 or equivalent.

Course examines alternative policies regarding urban housing markets, land use, transportation systems, environment protection, and poverty.

ECON 457. INDIVIDUAL STUDY, ECONOMICS OF THE CITY. Sem. 1 or 2. Arrange, cr. 2. Corequisite: ECON 456.

ECON 461. GOVERNMENTAL POLICY TOWARD BUSINESS. Class 3, cr. 3. Prerequisites: ECON 251 and MGMT 302 or equivalent.

Course examines the rationale behind and actual effects of federal government statutes and policies in the area of: public utilities, quasipublic utilities, anti-trust, consumer protection, and agriculture.

ECON 482. AMERICAN INDUSTRY AND ITS PLACE IN WORLD ECONOMY. Class 3, cr. 3. Prerequisite: ECON 210, 213, or 217.

Geographic and economic factors determining the location, structure, and economic power of leading American industries and their competitive position in the world economy.

ECON 490. PROBLEMS IN ECONOMICS. Cr. 1-4.

Supervised reading and reports in various subjects. Open only to a limited number of seniors with superior records in previous courses. Arrange with instructor before enrolling.

GRADUATE COURSES IN ECONOMICS

ECON 511. INTERMEDIATE ECONOMICS I. Class 3, cr. 3. For students in the management or agricultural economics graduate programs or by consent of instructor.

The structure of competitive and monopolistic markets, including the theory of price, the allocation of resources, and comparative advantage.

ECON 512. INTERMEDIATE ECONOMICS II. Class 3, cr. 3. For students in the management graduate programs or by consent of instructor.

Course content includes money and banking, national income and aggregative economics,

and balance of payments and determination of national income, employment, and price level, with reference both to theory and to economic policy.

ECON 513. ECONOMIC THEORY. Class 3, cr. 3. For students in the management graduate programs or by consent of school.

Theoretical analysis of a market economy with an emphasis on decision processes of managers. Consideration is given to micro aspects of price determination, utilization of resources and market organization, and to aggregative concepts of national income and employment.

ECON 518. NATIONAL INCOME AND FORECASTING. Class 3, cr. 3. Must be preceded by ECON 251 or 511 or equivalent.

Components and size of the national income; other aggregative measures of the economy and their use in economic forecasting.

ECON 519. THE MEANING OF PRICE AND RESOURCE ALLOCATION THEORY. Class 3, cr. 3. Must be preceded by ECON 210 or 219, or consent of instructor, and one course in teaching models. Designed for future social studies, business education and home economics teachers, but open to others.

The purpose of the first part of the course is to introduce the student to an analysis of how economic systems — in particular, the market system — answer the basic production, consumption and distribution questions.

ECON 522. PUBLIC FINANCE AND TAXATION. Class 3, cr. 3. Must be preceded by ECON 210, graduate standing, or consent of instructor.

Governmental budget policy in modern economics; a general framework of fiscal analysis, combining a normative theory of tax and expenditure determination with a systematic treatment of the effects of budget policy upon the economy's stability and growth; focus is on policy effectiveness and evaluation.

ECON 523. STATE AND LOCAL FINANCE. Class 3, cr. 3. Must be preceded by ECON 210 or 217 and, preferably, 522.

Taxation, expenditure and debt management problems of state and local goverment; grants-in-aid, subsidies, shared revenues and coordination of the financial policies of federal, state, and local governments.

ECON 525. GOVERNMENT AND THE ECONOMY. Class 3, cr. 3. Must be preceded by ECON 210 or graduate standing. (Not open to students with credit in ECON 425.)

Problems of government antitrust and regulation theory and practice. Particular attention is given to firm behavior in unregulated markets and the modifications of this behavior which result from government intervention.

ECON 530. MONEY AND FINANCE. Class 3, cr. 3. Must be preceded by ECON 252, graduate standing, or consent of instructor.

Analysis of financial policies and policy-making. Policymakers include the Federal Reserve, the Treasury, federally sponsored credit agencies, and the Congress through its legislative initiatives. Both the macroeconomic (inflation and unemployment) and sectoral (housing and state and local outlays versus business outlays) impacts of a wide variety of policies and legislation are considered.

ECON 534. INTERNATIONAL TRADE THEORY. Class 3, cr. 3. Must be preceded by ECON 210, graduate standing or consent of instructor. (Not open to students with credit in ECON 434 and/or 466.)

Study of the modern theory of the balance of payments, factor price equalization, the terms of trade equalization, and the theory of custom unions.

ECON 535. CURRENT WORLD ECONOMIC PROBLEMS. Class 3, cr. 3. Must be preceded by ECON 252, graduate standing, or consent of instructor.

Problems and issues in contemporary world economic affairs are studied intensively within the framework of the principles of international trade and payments theory. The U.S. balance-of-payments problems, reform of the international monetary system and the trading problems of developing countries are the major course topics.

ECON 560. THE ECONOMICS OF HEALTH. Class 3, cr. 3. Must be preceded by ECON 251.

The course is a microeconomic study of the allocation of resources to the health industry. Special characteristics of the industry include the mixture of profit and non-profit firms. Topics investigated are the supply and demand for health services such as physician, hospital, and nursing care.

ECON 561. INDIVIDUAL STUDY, THE ECONOMICS OF HEALTH. Arrange hours, cr. 2. Taken concurrently with ECON 560.

Additional readings in economics of health for students who desire to achieve depth in the field of study.

ECON 570. TRANSPORTATION ECONOMICS. Class 3, cr. 3. Must be preceded by ECON 251.

Study of the economic characteristics of the contemporary American transportation system with emphasis on the impact of governmental policies on resource allocation within the sector.

ECON 571. INDIVIDUAL STUDY, TRANSPORTATION ECONOMICS. Cr. 2. Taken concurrently with ECON 570.

Additional readings in transportation economics for students who desire to achieve depth in the field of study.

ECON 585. THE UNITED STATES AND THE WORLD ECONOMY IN RECENT TIMES. Class 3, cr. 3. Must be preceded by ECON 210 or graduate standing.

An economic history of the United States, Europe, and Japan in the twentieth century. Attention is given to the economic consequences of the World Wars, to the interwar depression, and to the postwar growth of the developed economics.

ECON 590. PROBLEMS IN ECONOMICS. Cr. 1-3.

Advanced study and investigation in a specific economic field under the guidance of the staff.

ECON 614. THEORETICAL FOUNDATIONS OF APPLIED MICROECONOMICS. Class 3, cr. 3. Must be preceded by ECON 609 or consent of instructor.

Areas of microeconomic theory particularly useful in applied work; extensive sampling of current journal literature in which these theoretical models are used in estimation work. Some representative areas studied are duality of cost and production relationships, aggregation and estimation of production relationships, consumers' surplus, and aggregation and estimation of demand relationships.

ECON 674. APPLIED ECONOMETRICS. Class 3, cr. 3. Must be preceded by ECON 672 or consent of instructor.

Application of econometric theory dealing with empirical problems of single- and multi-equation estimation as well as special topics such as constrained estimation, errors in variables, limited dependent variables and prediction. Use of the procedures to estimate empirical relationships, and construction of a small-scale model of the economy.

MANAGEMENT

UNDERGRADUATE LEVEL

MGMT 100. MANAGEMENT LECTURES. Class 1, cr. 1.

Survey of the field of industrial management.

MGMT 200. INTRODUCTORY ACCOUNTING. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. (Required of undergraduate students in pre-industrial management and industrial economics.)

An examination of the system by which accounting data is gathered from economic events. Construction and uses of financial statements.

MGMT 201. COST ACCOUNTING. Class 3, cr. 3. Prerequisite: MGMT 200 or equivalent.

An introduction to internal uses of accounting information. Consideration of budgeting and various inventory costing methods.

MGMT 300. FINANCIAL ACCOUNTING. Class 3, cr. 3. Prerequisite: MGMT 201 or equivalent.

Intermediate level accounting. Financial reporting to management, investors, and interested external parties. Emphasis on wealth and income measurement and rule formulation in contemporary problem areas.

MGMT 302. BUSINESS STATISTICS. Class 3, cr. 3.

Elementary statistics in business; descriptive statistics, parameter estimation, hypothesis testing, correlation and regression.

MGMT 305. QUANTITATIVE METHODS FOR MANAGEMENT I. Class 3, cr. 3. Prerequisites: MA 261 and ECON 216 or 251.

An introduction to quantitative decision procedures under uncertainty and the foundations of probability theory and statistical decision theory.

MGMT 306. QUANTITATIVE METHODS FOR MANAGEMENT II. Class 3, cr. 3. Prerequisite: MGMT 305.

An introduction to quantitative decision procedures under uncertainty and mathematical model building. Linear programming and other topics in operations research.

MGMT 310. FINANCIAL MANAGEMENT. Class 3, cr. 3. Prerequisite: MGMT 201 or 202.

Management of the financial affairs of the industrial enterprise. Treats short-term cash budgeting, asset management, captial budgeting, capital structure decisions, and dividend policy.

MGMT 324. MARKETING MANAGEMENT. Class 3, cr. 3. Prerequisite: MGMT 201 or equivalent.

A managerial approach to the job of learning to make a decision on product policy, distribution channels, pricing, personal selling, advertising, and marketing research.

MGMT 412. MONEY AND CAPITAL MARKETS. Class 3, cr. 3. Prerequisites: MGMT 310 and ECON 252 or 330.

General subject matter in the financial behavior of households, corporations, the federal government, and financial institutions such as commercial banks, savings and loan associations, life insurance companies, and finance companies. Emphasis is on interaction of these sectors in the determination of various interest rates in recent years.

MGMT 425. MARKETING PLANNING AND RESEARCH. Class 3, cr. 3. Prerequisites: MGMT 201, 302 and 320.

The management of the marketing research function in industrial firms. Emphasis on market research and information systems for planning and control.

MGMT 430. LABOR RELATIONS. Class 3, cr. 3. Prerequisite: a basic course in economic theory or consent of the department.

The course focuses on employee-employer relations under collective bargaining. Attention is also given to topics in trade union development and structure, wage analysis, the problem of economic insecurity, the role of government in labor relations, and employment aspects of the civil rights movement.

MGMT 431. PERSONNEL RELATIONS. Class 3, cr. 3.

Study of the personnel administration function in the business firm. Traditional staff functions and line and staff roles in motivation of employees.

MGMT 442. PERSONAL FINANCE. Class 3, cr. 3. Prerequisite: ECON 210 or 213.

Lectures and discussion on problems of managing one's personal finances. Covers budgeting; use of and cost of credit; life and property insurance; income and estate taxation; housing; wills, trusts and estate planning; saving and investments. Not available for credit towards economics and business economics concentrations.

MGMT 445. INVESTMENT MANAGEMENT. Class 3, cr. 3. Prerequisite: ECON 210 or 213.

Examination of investment alternatives relevant to the individual investor. Operations of the markets in which securities are traded. Theory and application of security valuation and portfolio selection techniques. Evaluation of investment performances.

MGMT 450. BUSINESS POLICY. Class 3, cr. 3. Prerequisite: MGMT 310, 422, or 320 or equivalent. (Credit will not be given for both MGMT 450 and 451.)

An extensive study of management problems in business at policy-making levels; primarily for students majoring in business economics.

MGMT 455. LEGAL BACKGROUND IN BUSINESS. Class 3, cr. 3. Prerequisite: ECON 210, 213, or 217, or consent of instructor.

Nature and place of law in our society, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts and agency.

MGMT 456. LEGAL BACKGROUND FOR BUSINESS II. Class 3, cr. 3. Prerequisite: MGMT 455 or 457. Continuation of MGMT 455.

A study of the legal effect and ramifications of negotiable instruments, bailments, security interests, and sales in the world of commerce. Discussion of the legal problems concerning real property, personal poperty, and economic relations and the law.

MGMT 461. MANAGEMENT OF OPERATIONS. Class 3, cr. 3. Prerequisite: MGMT 302 or consent of instructor.

An introductory course concerned with the management of production, distribution, and service system operations. The topics covered include facilities planning, job design, materials control, and the management of product quality.

MGMT 490. PROBLEMS IN INDUSTRIAL MANAGEMENT. Cr. 1-4. Arrange with instructor before enrolling.

Investigation in a specific management field.

GRADUATE COURSES IN MANAGEMENT

MGMT 503. FINANCIAL ACCOUNTING II. Class 3, cr. 3. Must be preceded by MGMT 300.

Advanced course in financial accounting. A range of contemporary issues in financial reporting such as business combinations, consolidations, price-level adjustments, multinationals, and partnership accounting are covered. Both technical proficiency and user applications are emphasized.

MGMT 504. TAX ACCOUNTING. Class 3, cr. 3. Must be preceded by MGMT 300.

Basic tax course designed to provide an understanding of the various federal taxes, including income, gift, estate, excise, federal insurance contribution, self-employment and unemployment taxes.

MGMT 505. MANAGEMENT ACCOUNTING II. Class 3, cr. 3. Must be preceded by MGMT 300.

Topics covered include decentralized financial performance measurement, cost analysis techniques, costs in planning and decision models, and financial control systems.

MGMT 506. AUDITING. Class 3, cr. 3. Must be preceded by MGMT 300, 401, and 505; also must be preceded by or taken concurrently with MGMT 402.

The systematic vertification of financial statements including a study of the reponsibilities, liabilities, and ethics of the independent Certified Public Accountant.

MGMT 512. FINANCIAL INSTITUTIONS AND MARKETS. Class 3, cr. 3. Must be preceded by MGMT 310 or MGMT 610. Not open to students with credit in MGMT 412.

Analysis of management policy of financial institutions, including liquidity management, liability management, asset management, and capital management; description of the legal, economic, and regulatory environments and their implications for management. Emphasis on commercial bank management.

MGMT 516. INVESTMENT MANAGEMENT. Class 3, cr. 3. Not open to students with credit in MGMT 445.

Treatment of problems of portfolio analysis, capital markets, and securities investment selection. Theoretical development and practical applications, at the level of the individual decision-maker.

MGMT 545. MANAGEMENT INFORMATION SYSTEMS. (CS 545)

MGMT 546. COMPUTER MODELING OF SOCIAL SYSTEMS. (CS 546)

MGMT 550. SEMINAR IN TOP MANAGEMENT PROBLEMS. Class 3, cr. 3. Enrollment restricted to management seniors and graduate students.

A seminar dealing with problems at the top management level. Included among the topics are: perception of service and profit opportunities, evaluation of available resources, formulation of objectives and strategies, implementation of strategies and operations plans, measurement of progress and performance, reevaluation of strategies, plans and organizations, international business operations, government regulations, financial risks and rewards of entrepreneurs and role of business leaders in a democratic society.

MGMT 553. LABOR LAW. Class 3, cr. 3. Must be preceded by MGMT 430 or consent of instructor.

A study of the common law and statutory law affecting union-management relations, with emphasis on current labor legislation including such areas as the National Labor Relations Act and amendments, the Railway Labor Act, wage and hour legislation, workmen's compensation, unemployment compensation, Occupational Health and Safety Acts and social security laws.

MGMT 560. OPERATIONS PLANNING AND CONTROL. Class 3, cr. 3. Must be preceded by MGMT 460 or 461 or consent of instructor.

This course is concerned with the management problems involved in planning and control systems. Four aspects of integrated operations planning and control systems are studied: forecasting, inventory control, scheduling, and aggregate production planning. Case studies are used to analyze a number of approaches that managers have taken in the development and administration of operations planning and control systems.

MGMT 561. BUSINESS LOGISTICS MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 306 or consent of instructor.

This course is concerned with the management problems involved in the physical distribution of product from plant to consumer. Topics include traffic management, facilities location, inventory control, and interdepartmental coordination.

MGMT 583. SMALL BUSINESS MANAGEMENT. Class 3, cr. 3. Must be preceded by three hours of accounting or consent of instructor. Open only to seniors and graduate students.

Analysis of problems and opportunities specifically related to the small company.

MGMT 584. NEW ENTERPRISES. Class 3, cr. 3. Must be preceded by or taken concurrently with MGMT 310 or MGMT 610. Not open to students with credit in MGMT 583.

Analysis of problems and opportunities specifically related to the small company.

MGMT 590. DIRECTED READINGS IN MANAGEMENT. Cr. 1-4.

Directed readings in management.

MGMT 600. FINANCIAL CONTROL I. Class 3, cr. 3.

A course dealing primarily with uses of accounting and financial information by non-accounting executives in business decisions. Students first learn the basic concepts underlying the preparation of financial statements and cost information; then emphasis is placed upon the uses of such information. Included among the topics are: projection of future results of operation and financial requirements, cost con-

trol, cost-price relationships, make-or-buy decisions and product selection.

MGMT 601. FINANCIAL CONTROL II. Class 3, cr. 3. Must be preceded by MGMT 600 or consent of instructor.

Continatuion of Financial Control I. Among the additional topics covered in this course are: planning capital expenditures, measurement of management efficiency, establishment and administration of budgetary control systems, management's custodianship responsibility, and government regulations related to cost and accounting information.

MGMT 606. SEMINAR IN EXTERNAL REPORTING. Class 3, cr. 3. Must be preceded by MGMT 601 or 603 or consent of instructor.

The seminar examines the major contemporary problems in measuring and reporting the performance of the firm.

MGMT 608. SELECTED RESEARCH TOPICS IN ACCOUNTING. Cr. 3. Must be preceded by MGMT 601 or 603 or consent of instructor.

Individual and group study of current research problems in accounting. A limited set of problem areas will be covered in any one offering. Emphasis will be placed on current substantive problems rather than research methods per se. Course may be repeated for credit.

MGMT 610. FINANCIAL MANAGEMENT I. Class I, cr. 1. For students in the management graduate programs or by consent of school.

Analysis of short-term working capital needs. Cash budgeting procedures, pro forma statements, major types of short-term loan arrangements, and short-term asset management.

MGMT 611. FINANCIAL MANAGEMENT II. Class 3, cr. 3. Must be preceded by MGMT 610.

Long-term capital structure planning, capital budgeting, treatment of uncertainty in investment decisions, security underwriting, dividend policies, and mergers.

MGMT 612. FINANCIAL MANAGEMENT III. Class 3, cr. 3. Must be preceded by MGMT 610 and 611.

Further treatment of topics in the financial management of non-financial corporations, from the viewpoint of the internal financial officer. Emphasis on applications. Continuation of MGMT 611, with additional depth and topic coverage.

MGMT 613. COMMERCIAL BANK MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 610 and 611.

Principles of business and consumer loan analysis. The role of banks in the capital markets. Internal operating procedures and problems of banks. Focus on the role and activities of the bank officer.

MGMT 620. MARKETING PLANS AND DECISION-MAKING. Class 3, cr. 3. For students in the management graduate programs or by consent of school.

An integrated analysis of major marketing decisions, including product, pricing, advertising, distribution, and sales force politics.

MGMT 621. TOPICS IN MANAGERIAL MARKETING ANALYSIS. Class 3, cr. 3. Must be preceded by MGMT 620.

Topics in marketing analysis with emphasis on the management of new product ventures, advertising, personal selling and marketing information systems.

MGMT 622. CONSUMER MARKETING STRATEGIES. Class 3, cr. 3. Must be preceded by MGMT 620.

A managerial orientation to decision-making in organizations dealing directly with mass consumer markets is provided. Important insights from the behavioral sciences are considered in light of decision objectives to develop capability in creation and management of consumer-oriented marketing campaigns.

MGMT 623. INDUSTRIAL MARKETING STRATEGIES. Class 3, cr. 3. Must be preceded by MGMT 620 or consent of instructor.

Marketing of goods and services to businesses and other organizations for use in their production and further marketing of goods and services is studied. Emphasis is placed on management of the field sales force, industrial buying processes, distribution channel development and maintenance, development and new industrial products, pricing and promotion decision.

MGMT 624. NEW PRODUCT AND NEW MARKET VENTURES. Class 3, cr. 3. Must be preceded by or taken concurrently with MGMT 620 or consent of instructor.

An intensive examination of the dynamic structure of markets and potential new products and services. Emphasis on the development and analysis of new market opportunities and managerial problems of implementation.

MGMT 625. RESEARCH IN MARKETING MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 620 and 670. For students in the management graduate programs or by consent of school.

Application of statistical and other quantitative concepts to marketing management problems.

MGMT 630. LEGAL AND SOCIAL FOUNDATIONS OF MANAGEMENT. Class 3, cr. 3. For students in the management graduate programs or by consent of school.

An examination of the nature of the legal environment from the viewpoint of the social and moral bases of law. Emphasis is given to the operation of our legal system and its significance in decision functions of management.

MGMT 631. THE PERSONNEL FUNCTION. Class 3, cr. 3.

Basic concepts involving the personnel function in the business organization. Line and staff roles, motivation and leadership theory, and personnel techniques.

MGMT 632. COLLECTIVE BARGAINING. Class 3, cr. 3. Not open to students with credit in MGMT 633.

An in-depth examination and analysis of the collective bargaining system in American industry. Emphasis is placed on understanding the environment, development, structure, process, and impact of collective bargaining.

MGMT 633. MANPOWER MANAGEMENT. Class 3, cr. 3. For students in the Management graduate programs or by consent of school. Not open to students with credit in MGMT 632.

Survey of problems in management of manpower resources with emphasis on problems of inter-institutional and inter-group relations. Specific topics include collective bargaining contexts, institutions and relationship patterns; negotiation and administration of collective agreements; the labor force; labor market structure and operation; public manpower policy; and corporate manpower administration.

MGMT 636. GOVERNMENT AND INDUSTRIAL RELATIONS. Class 3, cr. 3. Not open to students with credit in MGMT 553.

Survey of industrial relations law with special emphasis on current status of law of union-management relations. Scope and content of current legislation, selected topics in applied labor relations law, and the role of government.

MGMT 640. ECONOMICS AND SOCIAL POLICY. Class 2, cr. 2. For students in the management graduate programs or by consent of school.

The economic and social environment in which American industry operates.

MGMT 650. STRATEGIC MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 610 and 620. For students in the management graduate programs or by consent of school.

An advanced course to integrate previous graduate training in functional areas of industrial administration. The viewpoint taken is that of the general manager and total enterprise management. Special emphasis given to strategic and corporate planning.

MGMT 651. TOPICS IN STRATEGIC MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 650 or consent of instructor.

An elective course offering in-depth study of selected topics in strategic management. Among the topics to be offered are strategic and corporate planning, environmental and technological forecasting, formal planning systems, acquisition, diversification and divestiture, social responsibility, large-scale organizational structures, entrepreneurship.

MGMT 660. OPERATIONS MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 602, 610, 620 and 670, and taken concurrently with MGMT 671, or consent of instructor. For students in the management graduate programs or by consent of instructor.

Technique and methods employed by managers to plan and control manufacturing and other operating systems.

MGMT 661. MANAGEMENT OF OPERATING SYSTEMS. Class 3, cr. 3.

The analysis of complex operating problems from the viewpoint of senior executives.

MGMT 663. SELECTED TOPICS IN OPERATIONS MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 660 or consent of instructor.

Individual and group study of current research problems in operations management. Areas selected will range from problems in research methodology to the application of methodology to current problems in operations management, such as inventory theory, scheduling theory, business logistics, etc.

MGMT 664. PROBLEMS IN OPERATIONS MANAGEMENT. Class 3, cr. 3. Must be preceded by MGMT 660 or 661 or consent of instructor.

Selected topics will be covered that are of interest to the professional manager in administering and controlling operating systems. Such topics may involve the management of production, logistic, or service system operations.

MGMT 670. QUANTITATIVE METHODS I. Class 3, cr. 3. For students in the management graduate programs or by consent of school.

Introduction to quantitative decision procedures under uncertainty. Application of probability models. Bayesian inference, queueing models, hypothesis testing, and regression analysis to management problems.

MGMT 671. QUANTITATIVE METHODS II. Class 3, cr. 2. Must be preceded by MGMT 670.

A continuation of Quantitative Methods I. Introduction to quantitative decision procedures under certainty. Applications of linear algebra, linear programming, integer programming, network models, and convex programming to management problems.

MGMT 672. QUANTITATIVE METHODS III. Class 1, cr. 1. Must be preceded by MGMT 671 or consent of instructor. For students in the management graduate programs or by consent of school.

Introduction to quantitative decision procedures under uncertainty and the foundations of classical statistical procedures. Basic notions in the general theory of statistical games and principles of choice with applications in econo-

metrics and multivariate analysis. Theory and applications in estimation, testing, regression, and analysis of variance.

MGMT 676. MANAGEMENT SCIENCE. Class 3, cr. 3.

A course devoted to the study of the theory and application of management science and operations research models. Topics covered,with computer applications, are chosen from the theoretical and applied deterministic and stochastic mathematical programming literature.

MGMT 690. ADVANCED PROBLEMS IN INDUSTRIAL MANAGEMENT. Cr. 1-4. Admission by consent of department.

Advanced investigation in a specific management field at the graduate level.

MGMT 694. RESEARCH IN INDUSTRIAL RELATIONS. Cr. 3-6.

Application of statistical skills through participation in and discussion of actual research. Emphasis placed on understanding of the research process and communication of results for use in the decision-making process.

ORGANIZATIONAL BEHAVIOR

UNDERGRADUATE LEVEL

ORGB 330. BEHAVIORIAL SCIENCES IN ADMINISTRATION. Class 3, cr. 3.

An integrated social science approach to administrative problems and administrative behavior. Behavior in organizations is examined in the context of psychological and sociological principles with attention given to such problems as motivation, influence, communication, leadership, small group processes, and organizational change. Emphasis is placed on the development of theoretical and empirical skills in diagnosing and responding to interpersonal problems as well as experience-based learning.

ORGB 430. SOCIAL RESPONSIBILITY OF BUSINESS. Class 3, cr. 3. Prerequisite: ORGB 330 or permission of the instructor.

The orientation will be an interdisciplinary approach to an examination of the moral, ethical, social, and practical implications of the social responsibility of business. The aim of the course will be to raise as many of the alternative issues as possible via class readings, films, tapes, and guest speakers from the academic (e.g., economics, management, administrative sciences) and the business community.

ORGB 431. INTRODUCTION TO ORGANIZATIONAL CHANGE AND DEVELOPMENT. Class 3, cr. 3. Prerequisite: ORGB 330 or permission of the instructor.

This course introduces the student to planned approaches to adaptation and change in organizations. It is based upon applied behavioral science research and concepts which address themselves to "real-life" change problems: models of the change process, change strategies, the change agent, the critical study of organizational change efforts.

ORGB 432. INTRODUCTION TO ADMINISTRATIVE DECISION MAKING. Class 3, cr. 3. Prerequisites: ORGB 330, MGMT 302, senior standing, or permission of the instructor.

An introductory course in organizational decision making which focuses on the manager and examines critically his decision processes in situations that involve human behavior. Topics include a framework for the decision process, small group perspectives, organizational perspectives, and value dimensions of the decision process. The primary emphasis is on the individual manager and his performance as both a dependent variable within an organizational structure.

ORGB 490. PROBLEMS IN ADMINISTRATIVE SCIENCE. Cr. 1-4.

Supervised readings and reports in various subjects. Arrange with instructor before enrolling.

DUAL LEVEL

Undergraduate-Graduate

ORGB 590. PROBLEMS IN ADMINISTRATIVE SCIENCE. Cr. 1-4.

Supervised readings and reports in various subjects. Arrange with instructor before enrolling.

DEPARTMENT OF MANUFACTURING ENGINEERING TECHNOLOGIES AND SUPERVISION

C. David Rose, Head

FACULTY: G. E. Bock(Emeritus), R. G. Campbell, G. E. DeGraff, J. E. Deuel, E. C. Gallett, B. A. Hindmarch (Emeritus), C. F. Jenks, A. L. Kaye (Emeritus), R. F. McCormick (Emeritus), D. E. Norris (Emeritus), A. J. Parker (Emeritus), P. Perkins, C. D. Rose, D. J. Yovich.

The Department of Manufacturing Engineering Technologies and Supervision provides career educational opportunities to students whose interests and aptitudes lie in one of the following areas:

1. Industrial Education (IED), four year bachelor of science degree in Vocational-Industrial Teaching
2. Industrial Engineering Technology, (IET), two-year associate degree, plus two-year add-on bachelor of science degree — Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.
3. Mechanical Engineering Technology, (MET), two-year associate degree, plus two-year add-on bachelor of science degree — Accredited by the Technology Accreditation Commission of the Accreditation Board of Engineering and Technology.
4. Supervision, (SPV), two-year associate degree, and a bachelor of science degree.

A degree in Manufacturing Engineering Technology is not offered. However a student in either Industrial Engineering Technology or Mechanical Engineering Technology by proper selection of electives during the junior and senior years will be well qualified and job ready in this area.

A Certificate Program is available in Professional Supervision. This program is designed primarily for mature, part-time students whose interest lies in this particular area.

All programs offered by the Department are available to the part-time student who wishes to continue his educational objective.

Co-op work programs with industry or other organizations may be made available to students on an individual basis.

INDUSTRIAL EDUCATION

The Industrial Education section of the Department of Manufacturing Engineering Technologies and Supervision is concerned with one or more programs and activities designed to equip men and women for entrance into career fields that require an intellectual base upon which practical applications of the knowledge gained in the humanities, the sciences, and the technologies depend. Thus, the courses provided offer a combination of theoretical and practical education.

Graduate and undergraduate programs which prepare students for entrance into a variety of careers in education, government, and industry are available. Students may elect to pursue a major which will lead to the degree of Bachelor of Science in Industrial Education with a specialty in one of the following areas:

1. Vocational-Industrial Teaching
2. Industrial Arts Teaching

Vocational-Industrial Teaching: Vocational-industrial teaching, also known as trade and industrial teaching, is a part of the total Indiana program of vocational education. Vocational-industrial teachers must be occupationally competent in one of

the many skilled and technical crafts found in industry in the United States. In order to qualify for the vocational teaching license, the student must have completed at least three years of work above the learner level, in a craft, skilled trade, or some other type of industrial occupation, plus the general and professional education courses specified by the Teacher Training and Licensing Commission of the State Board of Education. The plan of study, when completed, entitles the student to a full-time provisional trade and industrial education teacher license.

Industrial Arts Teaching: Industrial arts, as a subject in public schools, deals with industrial aspects of our culture, emphasizing tools, materials, processes, and products of contemporary American industry. Problems of industrial production, planning, and marketing are considered from the viewpoints of labor, management, and the consumer. Social problems related to industrial production and the technological change are integral parts of the subject matter of industrial arts. It is a part of the formal program of general education.

BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL EDUCATION

In order to qualify for the degree of Bachelor of Science in Industrial Education the student must:

1. Complete the curriculum requirements in industrial education as listed in the plans of study which follow, with a selection of electives appropriate to a major area of specialization.
2. Complete at least 128 semester hours of course work
3. Present evidence of industrial work experience when such is required in certain curricula.

Vocational-Industrial Teaching

The prime purpose of this plan of study is to prepare individuals as teachers of vocational-industrial-technical subjects. Certification procedures require that such teachers be competent in the particular trade or occupation for which they are certified. Competency must be verified in terms of past occupational experience (usually three years beyond the learner level) or by controlled experience gained in a cooperative plan which is offered as an integral part of an undergraduate curriculum. Thus, there are two tracks to this plan of study. One track involves "demonstrated trade competency" based upon past occupational experience for which the student may be granted up to 32 semester hours of credit toward his degree. This may shorten the time to earn the degree to approximately three years. The other track provides opportunity for the individual to gain his occupational competency through "cooperative occupational internship" as a part of his degree requirement and gain a like amount of credit. This track requires five full calendar years for completion since it includes 30 months with industry.

Persons interested in pursuing either of these plans should consult the Department for a full explanation of details and procedures.

FRESHMAN YEAR

First Semester

(3) ENGL 104 (English Composition I)
(3) MA 147 (Algebra and Trigonometry I)
(1) IED 172 (Introduction to Industrial Education)
(3) PSY 120 (Elementary Psychology)
(3) Humanities Elective
(3) Social and Behavior Sciences Electives

(16)

Second Semester

(3) ENGL 105 (English Composition II)
(3) MA 148 (Algebra and Trigonometry II)
(3) ECON 210 (Principles of Economics)
(1) ED 101 (Introduction to the Foundations of Education)
(3) IED 270 (Principles of Philosophy of Vocational and Technical Education)
(3) Vocational Education/Technical Elective

(16)

SOPHOMORE YEAR

Third Semester

(3) IED 370 (Introduction to the Organization and Coordination of Vocational Technical Education)
(0) ED 202 (Teaching and Learning Seminar Secondary I)
(3) ED 220 (Psychology of Learning)
(3) PSY 362 (Adolescent Psychology)
(3) COM 114 (Fundamentals of Speech Communication)
(3) Vocational Education/Technical Elective

(15)

Fourth Semester

(4-3) Life and Physical Sciences Elective
(1) ED 203 (Teaching and Learning Seminar II)
(3) ED 221 (Society, School and the Professional Educator)
(3) Philosophy Elective
(3) IED 373 (Content Derivation and course construction)
(3) Elective

(16-17)

JUNIOR YEAR

(32) IED 462 Appraisal of Occupational Experience and Competency

SENIOR YEAR

Seventh Semester

(3) IED 371 (Instructional Planning and Evaluation)
(3) IED 443 (Vocational Youth Leadership Development)
(0) ED 302 (Teaching and Learning Seminar III)
(3) IED 375 (Teaching Methods in Occupational Education)
(4-3) Life and Physical Science Elective
(3) Humanities Elective

(15-16)

Eighth Semester

(3) ED 303 (Teaching and Learning Seminar IV)
(3) IED 471 (Organization and Management-Industrial Education)
(3) ED 336 (Reading in Middle and Secondary School Method and Problems)
(8) ED 464 (Supervised Teaching in Industrial Education Subjects)
(3) Vocational Education/Technical Elective

(18)

Industrial Arts Teaching

Prospective teachers of industrial arts study a broad core program of general education subjects essential for all teachers. In addition they develop technical competencies which will enable them to present effective instruction covering a broad range of industrial tools, materials, and processes. They complete a sequence of professional education courses including study of the American school system, educational psychology, methods of teaching, organization of instructional materials, and student teaching. Industrial arts teacher education at Purdue University also offers the individual student an opportunity to acquire a degree of specialization in one or more of the technical subject areas.

Complete program at West Lafayette only; transfer to West Lafayette Campus recommended after freshman year.

FRESHMAN YEAR

First Semester

(3) ENGL 104 (English Composition I)
(3) MA 153 (Algebra and Trigonometry I)
(3) PSY 120 (Elementary Psychology)
(3) COM 114 (Fundamentals of Speech Communication)
(1) IED 172 (Introduction to Industrial Education)
(2) Technical Elective

(15)

Second Semester

(3) ENGL 105 (English Composition II)
(3) MA 154 (Algebra and Trigonometry II)
(3) ECON 210 (Principles of Economics)
(3) Life and Physical Sciences (Elective)
(3) Humanities (Elective)
(1) ED 101 (Introduction to Foundations of Education)

(16)

SOPHOMORE YEAR

Third Semester

(3) PSY 362 (Human Development II: Adolescence)
(3) Humanities (Elective)
(3) Life and Physical Science (Elective)
(2) Technical Elective
(3) Social and Behavioral Science (Elective)

(14)

INDUSTRIAL ENGINEERING TECHNOLOGY

Program Coordinator, C. D. Rose

This field is designed to develop technicians to support the problem-solving and decision-making functions in management and to prepare for technological services in such industrial areas as production planning and control, work method analysis, work measurements, quality assurance and controls, and systems and procedures analysis. Practical applications of production-oriented operations, research techniques, data processing, and computer programming fundamentals are stressed. As an industrial engineering technician is concerned with an organization which has human dimensions at least as important as the technical ones, this aspect is also stressed throughout the curriculum.

The industrial engineering technician is often initially employed in the time study, quality control, stock control or factory layout department. As technicians gain experience, they generally advance within the department directly assisting a professional industrial engineer or become a supervisor. This broad technical background together with the human relations background and a proficiency in engineering and mathematics enables the industrial engineering technician to take advantage of opportunities for advancement in many directions.

ASSOCIATE IN APPLIED SCIENCE DEGREE (INDUSTRIAL ENGINEERING TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The two-year curriculum leads to the degree of Associate in Applied Science. An additional two years of study may lead to a Bachelor of Science degree.

The two-year program prepares students to take jobs doing motion study and work simplification, time study and work measurement, quality control and inspection, job evaluation, plant layout, production control, and cost and savings analyses work.

The program of study shown below is designed to give specialized study in methods improvement, materials handling, quality control, production, and general options as selected by the student.

FRESHMAN YEAR

First Semester

(2) ENGR 114 (Drafting Fundamentals)
(3) IET 104 (Industrial Organization)
(3) MA 147 (Algebra and Trig. for Tech. I)
(1) MET 100 (Applied Computations)
(4) PHYS 218 (General Physics)
(1) ENGL 185 (Developmental Reading)
(3) IET 120 (Systems and Procedures)

(17)

Second Semester

(3) ENGL 104 (English Composition)
(3) MA 148 (Algebra and Trig. for Tech. II)
(4) PHYS 219 (General Physics)
(2) MET 335 (Basic Machining)
(3) CIS 100 (Computer Utilization)

(15)

SOPHOMORE YEAR

Third Semester

(3) MA 221 (Calculus for Tech. I)
(3) STAT 301 (Elem. Statistical Methods)
(3) IET 250 (Fund. of Production Cost Analysis)
(3) IET 262 (Motion Study and Work Methods)
(3) SPV 252 (Human Relations in Supervision)

(15)

Fourth Semester

(3) ENGL 220 (Tech. Report Writing)
(3) IET 224 (Production Planning and Control)
(3) IET 266 (Work Measurement and Incentives)
(3) COM 115 (Fundamentals of Public Speaking)
(3) IET 270 (Plant Layout and Material Handling I)
(2) IET 272 (Job Evaluation)

(17)

TECHNICAL OPTIONS

Methods Improvement Option
(3) IET 120 (Systems and Procedures)
(2) IET 272 (Job Evaluation)
(2) IET 296 (Industrial Technology Case Problems)

Material Handling Option
(3) IET 270 (Plant Layout and Material Handling I.)
(3) IET 271 (Plant Layout and Material Handling II.)
(2) IET 296 (Industrial Technology Case Problems)

Quality Control Option
(3) STAT 402 (Elementary Statistics Methods II)
(2) IET 354 (Attribute and Variable Sampling)
(3) IET 364 (Total Quality Control)

Supervision Option
(3) SPV 350 (Applied Creativity in Business and Industry
(3) SPV 374 (Elements of Supervision)
(3) SPV 376 (Supervision and Personnel Problems)

General Option: As arranged with counselor
Note: Student may substitute any of the above options.

BACHELOR OF SCIENCE DEGREE (INDUSTRIAL ENGINEERING TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

Graduates of the two-year industrial engineering technology program are eligible for admission to this two-year "add-on" curriculum.

This curriculum is designed to develop technicians to support the problem-solving and decision-making functions in management and to prepare students for technological services in such industrial engineering areas as production planning and control, work methods analysis and work measurement, quality assurance and control, cost analysis, and systems and procedures analysis. Practical application of production oriented operations, research techniques, data processing, and computer programming fundamentals are stressed. The essentials of management with which foremen, supervisors, and administrative personnel are concerned are covered.

JUNIOR YEAR

Fifth Semester
(3)ECON 210 (Principles of Economics)
(4) EET 102 (Electrical Circuits)
(3) SPV 474 (Conference Leadership Training)
(3) ENGL 422 (Industrial Writing)
**(3) IET 271 (Plant Layout and Material Handling II)

(16)

Sixth Semester
(3) Technology Elective
(3) CIS 200 (Computer Programming Fundamentals)
(3) SPV 331 (Occupational Safety and Health)
(3) Science or Technology Elective
(2) MET 380 (Materials and Processes)
**(2) IET 354 (Attribute and Variable Sampling)

(16)

SENIOR YEAR

Seventh Semester	Eighth Semester
(3) COM 315 (Technical Speech)	(3) MET 400 (Power Systems)
(3) HESS Elective	(3) COM 415 (Discussion of Technical Problems)
(3) SPV Elective	(3) IET 497 (Senior Project)
(3) Technology Elective	(3) HESS Elective
**(2) IET 296 (Industrial Technology Case Problems)	**(3) IET 364 (Total Quality Control)
**(2) IET 220 (Critical Path Scheduling)	
(16)	(15)

MECHANICAL ENGINEERING TECHNOLOGY

Program Coordinator, P. Perkins

Mechanical Engineering Technology is concerned with the generation, transmission, and utilization of mechanical and fluid energy in the design and production of tools and machines and their products. The programs are intended to prepare specialists for the development of machine products for production processes for the installation and maintenance of machines, for solving practical engineering problems, and to prepare the necessary sketches and drawings for design proposals, experimental models, prototype configurations, and production parts and assemblies.

ASSOCIATE IN APPLIED SCIENCE DEGREE (MECHANICAL ENGINEERING TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

Associate Degree graduates in Mechanical Engineering Technology accept jobs in laboratories, engineering departments, plant maintenance, production departments, and technical sales. With additional experience, promotion to positions such as industrial supervisors, machine and tool designers, technical buyers, production expeditors, and cost estimators is possible. Graduates are eligible for certification as associate engineering technicians.

FRESHMAN YEAR

First Semester	Second Semester
(3) MA 147 (Algebra and Trigonometry for Technology I)	(3) MA 148 (Algebra and Trigonometry for Technology II)
(4) PHYS 218 (General Physics)	(4) PHYS 219 (General Physics)
(1) MET 100 (Applied Computations)	(3) MET 208 (Applied Statics)
(2) ENGR 114 (Engineering Drawing)	(2) MET 180 (Materials and Processes)
(3) MET 105 (Introduction to Engineering Technology)	(3) ENGL 104 (English Composition)
(1) ENGL 185 (Developmental Reading)	(2) MET 335 (Basic Machining)
(14)	(17)

**Sequence shown is typical and will vary according to option selected in Associate Program.

SOPHOMORE YEAR

Third Semester

(3) MA 221 (Calculus for Technology I)
(4) MET 211 (Applied Strength of Materials)
(3) MET 330 (Introduction to Fluid Power)
(3) MET 232 (Dynamics)
(3) MET 204 (Production Drawing)

(16)

Fourth Semester

(3) ENGL 220 (Technical Report Writing)
(3) COM 115 (Fundamentals of Public Speaking)
(3) MET 200 (Power System)
(4) MET 216 (Machine Elements)
(3) MET elective

(16)

BACHELOR OF SCIENCE DEGREE (MECHANICAL TECHNOLOGY)

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

Graduates of the two-year mechanical engineering technology program are eligible for admission to this two-year "add-on" curriculum.

This baccalaureate program prepares graduates as technologists to fill technical positions in manufacturing and production industries such as production supervisor, plant engineer, tool engineer and project engineer.

With a detailed knowledge of the relevant practices, procedures, and codes, graduates of this program become important components in today's industrial society. In some employment situations, the technologist assists the engineer or scientist in the creation, design, and production of devices and systems. In other employment situations they perform the above functions largely or completely on their own. The ability to communicate together with the knowledge of the basic theories and the understanding of their application to the reality of industrial practice provides an exciting and expanding future.

The plan of study provides for the broadening of the associate degree graduate in communications, interpersonal relations, supervision techniques, and associated technical areas.

JUNIOR YEAR

Fifth Semester

(4) EET 102 (Electrical Circuits I)
(3) CIS 200 (Computer Programming Fundamentals)
(3) ENGL 422 (Industrial Writing)
(3) ECON 210 (Principles of Economics)
(3) Technical specialty elective

(16)

Sixth Semester

(4) EET 152 (Electrical Circuits II)
(3) MA 222 (Calculus for Technology II)
(3) HESS elective
(3) SPV 252 (Human Relations in Supervision)
(3) Technical specialty elective

(16)

SENIOR YEAR

Seventh Semester

(4) EET 212 (Electrical Power and Machinery)
(3 or 4) Science elective
(3) COM 315 (Speech Communications of Technical Information)
(4) IET 450 (Production Cost Analysis)
(3) Technical specialty elective
(1) MET 495 (Senior Project Survey)

(17 or 18)

Eighth Semester

(3) IET 224 (Production Planning and Control)
(3) HESS elective
(3) COM 415 (Discussion of Technical Problems)
(3) MET 497 (Senior Project)
(3) Technical specialty elective

(15)

Note: Technical specialty elective: a four course sequence of technical courses selected to meet the students educational objective as approved by Department Head.

SUPERVISION

Program Coordinator, C. F. Jenks

Undergraduate programs in Supervision are designed to prepare students for careers in supervisory management, personnel work, and employee training and development. These careers are found in business, education, government, hospitals, industry and service organizations.

There are three programs offered: a certificate; an Associate Degree in Applied Science; and a Bachelor of Science Degree.

CERTIFICATE PROGRAM

Professional Supervision

The professional supervision certificate program is an intensive and practical curriculum equivalent to 24 semester hours. It is intended to provide supervisors with the professional education needed to handle the many supervisory and technical problems which they meet daily in technical, communications, and human relations fields.

The program has been set up by representatives of business and industry, professional supervisor's organizations, and the Supervision Program Coordinator. It is designed to meet the needs of management, which is vitally concerned with training supervisors for positions of leadership. Enrollment is on the basis of a program worked out with the counselor assigned and carefully tailored to individual needs.

Students admitted in the temporary classification may qualify for the certificate in professional supervision by taking approved undergraduate level, lower-division technology courses for which their admission classification establishes eligibility and for which they have necessary prerequisites.

Before receiving the Professional Supervision Certificate, the candidate must have had two years of successful experience in the management field. Satisfaction of this requirement is met by a confirming letter from the managerial employer under whom the candidate worked.

Appropriate credits earned in this program while in the temporary student classification may be used for credit toward an associate in Applied Science degree (particularly the Associate in Applied Science degree in professional supervision) under rules governing reclassification as a regular student.

Required Courses

(3) IET 104 (Industrial Organization)
(3) SPV 252 (Human Relations in Supervision)
(3) COM 115 (Fundamentals of Public Speaking)

Optional Courses

Group 1-14 semester hours maximum	**Hours Maximum**
Communications	10
English and report writing	7
Advanced courses in interpersonal communication	3
Economics and labor relations	6
Physical sciences	12
Group II-8 semester hours maximum	
Courses specific to two-year certificate curricula	8

Courses from one or more technologies may be elected in this group provided (1) they relate directly to the individual's duties, responsibilities, or line of promotability and (2) prior approval of the counselor and the head of the department administering the program is obtained.

ASSOCIATE IN APPLIED SCIENCE DEGREE (PROFESSIONAL SUPERVISION)

This program is designed to meet the needs of individuals who wish to improve their skills as supervisors as well as their general educational base.

Recognizing there are many different types of industries and different supervision needs, a student's program is planned jointly by the individual and an academic adviser.

The curriculum is college level, culminating in the awarding of the Associate in Applied Science degree. Graduates of the program are eligible to continue toward a Bachelor of Science degree in supervision.

General Plan of Study

CORE

Course Number	Course Description	Credit Hours
SPV 252	(Human Relations in Supervision)	3 hours
SPV 331	(Occupational Safety and Health)	3 hours
IET 104	(Industrial Organization)	3 hours
SPV 374	(Elements of Supervision)	3 hours
SPV 375	(Basic Methods of Training for Supervisors)	3 hours
SPV 376	(Supervision and Personnel Problems)	3 hours
	Sub Total	18 hours

COMMUNICATIONS AREA

ENGL 104	(English Composition I)	3 hours
COM 115	(Fundamentals of Public Speaking)	3 hours
	Sub Total	6 hours

FUNCTIONAL AREA

Recognizing that supervisors work in various functional areas, each supervisor will be expected to select one or more groups of courses that are designed to increase effectiveness on the job. The following are typical examples of functional areas.

Computer Programming
Construction Technology
Electrical Engineering Technology
Industrial Engineering Technology
Mechanical Engineering Technology
Personnel/Labor Relations

Sub Total ..... 15 credit hours

SUPPORTIVE AREA

Supervisors should have a balanced educational experience. Therefore, they should take certain technical and nontechnical courses. Some of the more typical courses considered applicable are listed below:

Nontechnical

SOC	100	(Introductory Sociology)
PSY	120	(Elementary Psychology)
ENGL	220	(Technical Report Writing)
ECON	210	(Principles of Economics)

Sub Total..... 12 credit hours

Technical

MA	147	(Algebra and Trigonometry for Technology I)
MA	148	(Algebra and Trigonometry for Technology II)

MA/SCI Elective
IET or Technical Option Elective

Sub Total..... 12 credit hours
Grand Total..... 63 credit hours

BACHELOR OF SCIENCE DEGREE (SUPERVISION)

FRESHMAN YEAR

First Semester

(3) ENGL 104 (English Composition)
(3) MA 147 (Algebra and Trigonometry for Technology I)
(3) PSY 120 (Elementary Psychology)
(3) SPV 252 (Human Relations in Supervision)
(3) IET 104 (Industrial Organizations)

(15)

Second Semester

(3) COM 115 (Fundamentals of Public Speaking)
(3) SOC 100 (Introductory Sociology)
or (3) SOC 312 (American Society)
(3) MA 148 (Algebra & Trigonometry for Technology II)
(3) SPV 331 (Occupational Safety & Health)
(3) Technical Option Elective
(3) Technical Option Elective

(18)

SOPHOMORE YEAR

Third Semester

(3) ECON 210 (Principles of Economics)
(3) SPV 374 (Elements of Supervision)
(3) ENGL 220 (Technical Report Writing)
(3) Technical Option Elective
(3) Technical Option Elective

(15)

Fourth Semester

(3) IET Elective/Technical option
(3) MA/SCI Elective
(3) SPV 375 (Basic Method of Training)
(3) SPV 376 (Supervision and Personnel Problems)
(3) Technical Option Elective

(15)

63 Total Credit Hours

JUNIOR YEAR

Fifth Semester

(3) MGMT 200 (Introductory Accounting)
(4) PHYS 218 (General Physics)
(3) SPV 332 (Industial Hygiene)
(3) MA/SCI Elective
(3) Elective

(16)

Sixth Semester

(3) General Education Elective
(2) Elective
(3) Technical Option/IET Elective
(3) MGMT 201 (Cost Accounting)
(3) SPV 350 (Applied Creativity for Business & Industry
(3) Introductory CIS Course

(17)

SENIOR YEAR

Seventh Semester

(3) MGMT 430 (Labor Relations)
(3) IET Elective/Technical Option
(3) SPV 474 (Conference Leadership Training)
(3) General Education Elective
(3) Elective

(15)

Eighth Semester

(3) SPV 462 (Work Experience Seminar)
(3) MGMT 431 (Personnel Relations)
(3) Communication Elective
(3) ENGL 422 (Industrial Writing)
(3) Elective

(15)

126 Credit Hours for Bachelors Degree

INDUSTRIAL EDUCATION

UNDERGRADUATE LEVEL

IED 172. INTRODUCTION TO INDUSTRIAL EDUCATION. Class 1, cr. 1.

Overview of industrial education with emphasis on its relationship to industry and schools.

IED 270. PRINCIPLES AND PHILOSOPHY OF VOCATIONAL AND TECHNICAL EDUCATION. Class 3, cr. 3.

An introduction to the origin, scope, evolution, and objectives of Vocational and Technical Education. Emphasis will be placed on the need for Vocational-Technical Education and its relation to other types of education.

IED 362. COOPERATIVE OCCUPATIONAL INTERNSHIP. Cr. 3-5. May be repeated to a maximum of 32.

Organized and supervised experience directed toward occupational competence in a specified skilled or technical occupation or staff position as required for vocational teacher certification, applied technology teaching, or industrial supervisory and personnel positions. Planned and supervised by departmental staff in cooperation with business, industry, labor, government, and other employing organizations and agencies. Consent of department required.

IED 370. INTRODUCTION TO THE ORGANIZATION AND COORDINATION OF VOCATIONAL AND TECHNICAL EDUCATION. Class 3, cr. 3.

An introduction to the organization and coordination of Vocational and Technical Education. Areas of emphasis include delivery systems, funding, state plan, credentialing systems, public relations, recruitment/placement/follow-up, youth organizations, trends and issues.

IED 371. INSTRUCTIONAL PLANNING AND EVALUATION. Class 3, cr. 3.

Experiences in selecting content, writing objectives, planning lessons, preparing a unit of study, evaluating student progress, developing instructional and audio-visual materials as they relate to industrial education. Field trips are required.

IED 373. COURSE DERIVATION AND COURSE CONSTRUCTION. Class 3, cr. 3.

Utilization of modern occupational analysis techniques in the identification and selection of

content into courses of study, including course goals and objectives, priorities, specifications, content outlines, and other essential elements.

IED 375. TEACHING METHODS IN OCCUPATIONAL EDUCATION. Class 3, cr. 3.

Development of competencies in the use and appraisal of the basic methods of teaching occupational subjects. Appropriateness, advantages, and limitations of specific methods.

IED 443. VOCATIONAL YOUTH LEADERSHIP DEVELOPMENT. Class 3, cr. 3.

The role and function of vocational youth groups; planning programs, public relations, and social activities; responsibilities of officers, leadership principles and style. VICA organization and activities emphasized. Field trips are required.

IED 462. APPRAISAL OF OCCUPATIONAL EXPERIENCE AND COMPETENCY. Cr. 0-32 department credit.

Industrial trade, technical or other occupational experience will be evaluated and a maximum of 32 semester hours credit may be granted. Full credit will be considered only for those candidates who have a minimum of three years appropriate occupational requirement for vocational certification as established by the Indiana State Plan for Vocational Education. Areas of weakness may be strengthened through enrollment in laboratory courses and/or in IED 362 as required by the advisor.

IED 465. INTERNSHIP IN VOCATIONAL TECHNICAL EDUCATION TEACHING. Credit 8.

An internship for Vocational-Industrial Education students who hold Conditional Vocational Certification and have three years of full time teaching. Internship should consist of supervised experience by University personnel over a period of one semester while student is a conditional vocational teacher.

IED 472. ORGANIZING AND MANAGING INDUSTRIAL EDUCATION FACILITIES. Class 3, cr. 3.

Experiences in organizing and systematizing the selection, purchase, arrangement, and maintenance of tools, equipment, and supplies in industrial education facilities. Emphasis is placed on the development and implementation of safety programs conforming to OSHA regulations. Field trips are required.

INDUSTRIAL ENGINEERING TECHNOLOGY

UNDERGRADUATE LEVEL

IET 104. INDUSTRIAL ORGANIZATION. Class 3, cr. 3.

A detailed survey of organizational structures; operational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy, and human factors necessary for effective management.

IET 120. SYSTEMS AND PROCEDURES. Class 3, cr. 3.

An introduction to the systems concept. Surveys recognizing and defining the system's problem; the management audit and tools for systems analysis; design and control of forms, work simplification, work measurement and procedures; operations research; punched card systems; management and administration; and organization of the systems function.

IET 204. TECHNIQUES OF MAINTAINING QUALITY. Class 2, Lab. 2, cr. 3. Prerequisites: MA 111 and 112, or MA 148.

An analysis of the basic principles of quality control. Includes statistical aspects of tolerances, basic concept of probabilities, frequency distribution, X and R charts and uses of mechanical, electronic, air and light devices for checking and measuring to determine quality levels of acceptance.

IET 220. CRITICAL PATH ANALYSIS. Class 1, Lab. 2, cr. 2.

Detailed study of planning and control of a schedule by network techniques, including the time/cost analysis of CPM scheduling for application on construction projects, job shop scheduling and related problems. Includes an introduction to PERT and the use of the computer for network analysis.

IET 224. PRODUCTION PLANNING AND CONTROL Class 3, cr. 3.

Preproduction planning of the most economical methods, machines, operations, and materials for the manufacturer of a product. The planning, scheduling, routing, and detailed procedure of production control. Includes the use of computers to perform simulations and solve production problems.

IET 250. FUNDAMENTALS OF PRODUCTION COST ANALYSIS. Class 3, cr. 3. Prerequisite or corequisite: IET 104.

Surveys of fundamental mechanics of accounting, principles of account classification, financial and operating statements, and the generation of cost data according to cost accounting principles. Surveys the generation of cost data according to the principles of engineering economy. Examines applications of cost accounting

data and engineering economy cost data to specific management decision areas through selected case problems. Computer applications for determining rate of return for complex problems are introduced.

IET 260. MOTION AND TIME STUDY. Class 3, cr. 3. (Not open to IET majors.)

Techniques of motion and time study, process charts, operation charts, multiple activity charts, micromotion study, Therbligs, stop watch time study, standard data, predetermined time systems, work sampling and computer aided work measurement.

IET 262. MOTION STUDY AND WORK METHODS. Class 2, Lab. 2, cr. 3.

The study of the various techniques of motion study including process charts, operation charts, multiple activity charts, micro and memo motion study, Therbligs, the movie camera, along with actual practice in their use. Includes study and application of the basic principles used to develop better methods of performing work.

IET 266. WORK MEASUREMENT AND INCENTIVES. Class 2, Lab. 2, cr. 3. Prerequisite: IET 262.

A study of the fundamentals of time study and work measurement with actual practice in their use. Includes stop watch time study, measuring work with movie camera, the establishment of allowances by both stop watch and work sampling studies, the establishment and use of predetermined time values, and the construction and use of work measurement formulae.

IET 268. PLANT LAYOUT. Class 2, Lab. 2, cr. 3. Prerequisite: EG 114 or equivalent.

Arrangement of stock, machine, layout of aisles, and use of space, and material handling for the highest efficiency of production.

IET 270. PLANT LAYOUT AND MATERIAL HANDLING I. Class 3, cr. 3. Prerequisite: IET 104 or permission of instructor.

A study of the fundamentals, principles and tools used to plan the physical arrangement of industrial facilities. Evaluation criteria used to select equipment needed to move materials.

IED 271. PLANT LAYOUT AND MATERIAL HANDLING II. Class 2, Lab. 3, cr. 3. Prerequisite: IET 270.

Application of the fundamentals, principles and tools used in Plant Layout and Material Handling to selected case problems. Survey and evaluation of available material handling equipment.

IET 272. JOB EVALUATION. Class 2, cr. 2.

A survey of the basic principles and significance of job evaluation. An analysis of current practices and techniques used in job analysis, job descriptions, and job evaluation.

IET 296. INDUSTRIAL TECHNOLOGY CASE PROBLEMS. Class 2, cr. 2.

Application of theories developed in the several industrial technology courses to selected general case problems — to provide practice in the integration of principles.

IET 299. INDUSTRIAL ENGINEERING TECHNOLOGY. Class 0-4, Lab. 0-9, cr. 1-9. Hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

IET 312. MATERIALS HANDLING. Class 3, cr. 3. Prerequisite: IET 104.

A survey of materials handling elements, the unit load, packaging, bulk handling, the economics of materials handling, improving existing handling methods, justification for handling equipment, special handling techniques, and the management of the materials handling divisions in the industrial organization.

IET 323. PRODUCTION PLANNING AND EXPEDITING. Class 2, Lab. 3, cr. 3.

Methods of planning for routing, tooling, equipment, costing and production of manufactured and processed products. Includes a detailed study of expediting procedures.

IET 354. ATTRIBUTE AND VARIABLE SAMPLING. Class 2, cr. 2. Prerequisite: IET 204.

Survey single, double, sequential, variable, and continuous production sampling plans. It includes the calculation and plotting of OG, AOQ, and AOQL curves and determining the economic sampling number. Also includes the use of Dodge Romig, MIL STD 105 and MIL STD 414 tables.

IET 364. TOTAL QUALITY CONTROL. Class 3, cr. 3.

The course is aimed at determining customer needs and wants, interpreting these into a design during production, follow-up on field performance, and feeding back quality information to further improve the quality system.

IET 404. INDUSTRIAL ORGANIZATION. Class 3, cr. 3. (Not open to students who have had IET 104.)

A study of industrial organization structures and an introduction to managerial responsibilities including the activities of industrial administration, financing, managerial controls, product development, manufacturing engineering, material control, quality control, and manpower management areas of operations.

IET 450. PRODUCTION COST ANALYSIS. Class 3. cr. 3. (Not open to students who have had IET 250.)

An introduction to financial statements and to the study of the costs of production in terms of break-even and least cost alternatives including present and future costs when related to the time value of money, budgeting, labor and overhead, production cost control and the role of the supervisor and the industrial engineering technologist to cost control. Computer applications for determining rate of return for complex problems are introduced.

IET 497. SENIOR PROJECT. Class 2, Lab. 2, cr. 3.

Hours to be arranged. Directed work on individual projects for senior industrial engineering technology students.

MECHANICAL ENGINEERING TECHNOLOGY

UNDERGRADUATE LEVEL

MET 100. APPLIED ENGINEERING COMPUTATIONS. Lab. 3, cr. 1. Prerequisite or corequisite: MA 147.

Techniques in solving typical problems in Mechanical Engineering Technology through the use of calculators and computers. How to draw graphs and prepare reports.

MET 105. INTRODUCTION TO ENGINEERING TECHNOLOGY. Class 1, Lab. 6, cr. 3. Prerequisite or corequisite: MA 147.

Orientation topics covering plan of study, departmental and university services, "How to Study," Engineering Technology as a profession and an introduction to the design process.

MET 112. APPLIED MECHANISMS. Class 3, cr. 3 or Class 1, Lab. 5, cr. 3.

An analysis of motions, displacements, velocities, friction wheels, instant centers, flexible connectors, cams, linkages, and gears.

MET 156. GRAPHICAL COMPUTATIONS. Lab. 6, cr. 3. Prerequisite: ENGR 114; prerequisite or corequisite: MA 147.

Descriptive geometry principles applied to the solution of engineering problems, intersections and development of planes and solids; layout of objects in space; and determination of clearances between objects in space.

MET 157. ELECTRICAL AND ELECTRONIC DRAFTING. Class 0, Lab. 5, cr. 2.

A basic course in drawing for electrical engineering technology students, with emphasis on orthographic projection, sketching and print interpretation relevant to the electrical and electronics industry, utilization of electrical symbols, projection and dimensioning practice, sectioning and conventional practice in executing fabrication of electrical detail and assembly drawings, execution of schematic drawings, block diagrams, cable drawings, wire lifts, printed circuits, and vendor's parts. Problems are designed to require practical reasoning and development of good techniques.

MET 180. MATERIALS AND PROCESSES. Class 2, cr. 2.

Application and characteristics both physical and chemical, of the materials most commonly used in industry; the primary processes involved in producing these materials for industry.

MET 200. POWER SYSTEMS. Class 3, cr. 3. Prerequisite: MA 147.

A survey of steam and nuclear power plants, internal combustion engines, gas turbines, pumps, compressors, fans and blowers, refrigeration. Some theory in thermodynamics, combustion of fuels, heat transfer. Power generation and application to various fields with special mention of transportation.

MET 204. PRODUCTION DRAWING. Lab. 6, cr. 3. Prerequisites: ENGR 114 and MET 335.

Application of principles of engineering drawing to detail, assembly, design layout equipment installation, and related drawings.

MET 208. APPLIED STATICS. Class 3, cr. 3. Prerequisite: MA 147 or 150.

Force systems, resultants and equilibrium, centroids of areas and centers and centers of gravity of bodies, trusses, frames, beams, friction and moments of inertia of areas and bodies.

MET 211. APPLIED STRENGTH OF MATERIALS. Class 4, cr. 4 or Class 3, Lab. 2, cr. 4. Prerequisite: MET 208.

Principles of applied strength on materials primarily with reference to mechanical design. Includes the use of computers to perform simulations and solve design problems.

MET 212. MECHANICS OF MATERIALS. Class 4, cr. 4 or Class 3, Lab. 2, cr. 4. Prerequisite: MA 148.

Forces acting on rigid bodies at rest and in motion: embracing vectors, force laws and moment laws of equilibrium for various force systems, centroids, center of gravity and moments of inertia, stress and strain, riveted and welded joints, torsion, shear, bending and deflection of beams, combined stresses and columns.

MET 216 MACHINE ELEMENTS. Class 4, cr. 4, or Class 3, Lab. 2, cr. 4. Prerequisites: MET 204 and 211.

A survey of the more important elements used in tools and machines, and their general characteristics pertaining to application, operational behavior, efficiency, economy, and standardization.

MET 228. MACHINE DESIGN I. Lab. 6, cr. 3. Prerequisites: MET 216 and MET 330.

Practical applications in the design of machines and products utilizing mechanical, pneumatic, hydraulic and electrical operation and control.

MET 232. DYNAMICS. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisites: MET 208.

Basic fundamentals of dynamics; displacement, velocities, acceleration, work energy, power, impulse, momentum, and impact. Includes the use of computers to perform simulations and solve design problems.

MET 257. INTERDISCIPLINARY DRAFTING. Class 1, Lab. 6, cr. 3. Prerequisites: EG 114, MET 180.

A course designed to be of an interdisciplinary drafting nature, providing introductory training in the area of electromechanical drafting, civil, architectural and structural drafting; industrial engineering drafting; fluid power drafting; and computer drafting. To introduce students to the various drafting disciplines on a fundamental basis, and to develop reasonable proficiency in one or more of the disciplines on a project basis.

MET 280. BASIC TOOL DESIGN. Class 1, Lab. 5, cr. 3. Prerequisites: MET 204, MET 211.

Lectures, classroom discussions and actual drawing board work are combined to gain knowledge and experience necessary to design tools commonly used in modern manufacturing processes. Course consists of designing and laying out cutting tools, gauges, simple jigs, fixtures, punches and dies as employed in mass production processes.

MET 299. MECHANICAL ENGINEERING TECHNOLOGY. Cr. 1-9.

Hours and subject matter to be arranged by staff. Primarily for third or fourth semester students with special aptitudes.

MET 300. APPLIED THERMODYNAMICS. Class 3, cr. 3. Prerequisites: MA 221.

The fundamentals of thermodynamics, including applications of the first and second laws, enthalpy, entropy, and reversible and irreversible processes.

MET 330. INTRODUCTION TO FLUID POWER. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3.

Properties of hydraulic fluids, generation, transmission and utilization of hydraulic power, hydraulic and pneumatic controls and circuits.

MET 335. BASIC MACHINING. Class 1, Lab. 3, cr. 2.

A comprehensive survey of machine tools as they are used in converting work-pieces into finished products with consideration of cost, quality, quantity, and interchangeability. Actual operation analysis of many machine tool set ups will be provided for comparison studies.

MET 340. PIPING AND PLUMBING DESIGN. Class 3, cr. 3. Prerequisites: MET 330 and MET 211.

Design of plumbing systems, includes losses in pipes, fittings, nozzles, orifices, etc. Includes steam, water, and oil systems. Piping handbooks and catalogs are utilized in conjunction with the State of Indiana Piping Code.

MET 350. APPLIED FLUID MECHANICS. Class 3, cr. 3. Prequisite: MET 200.

The fundamentals of fluid mechanics, including properties of fluid, pressure; hydrostatic force on submerged areas; kinematics and dynamics of fluid flow; friction losses and sizing of pipes.

MET 360. HEATING, VENTILATING, AND AIR CONDITIONING. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisite: MET 200 or 400.

A study of heat losses, heat producing equipment and cooling equipment in addition to the design of the direct systems. Includes controls and cost estimating for commercial, industrial and residential systems. Codes and standards are emphasized throughout the course. The use of computer programming to analyze cooling loads and neat gains.

MET 361. REFRIGERATION. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisite: MET 360.

Design and maintenance of refrigeration systems for large and small applications. This course is intended to complement MET 260 for large air conditioning systems.

MET 380. MATERIALS AND PROCESSES. Class 2, cr. 2. Open only to non-MET students.

Application and characteristics, both physical and chemical, of the materials most commonly used in industry; the primary processes involved in producing these materials for industry.

MET 384. INSTRUMENTATION. Class 2, Lab. 3, cr. 3. Prerequisite: MA 148 or permission of instructor.

Student of measurement theory and principles, including temperature, pressure, level, flow and similar measurement used to control manufacturing processes.

MET 400. POWER SYSTEMS. Class 3, cr. 3. Prerequisite: open only to non-MET students having had MA 148.

A survey of steam and nuclear power plants, internal combustion engines, gas turbines, pumps, compressors, fans and blowers, refrigeration. Some theory in thermodynamics, combustion of fuels, heat transfer. Power generation and application to various fields with special mention of transportation.

MET 412. MECHANICS OF MATERIALS. Class 4, cr. 4. Prerequisite: MA 148. Open only to non-MET students.

Forces acting on rigid bodies at rest and in motion-embracing vectors, force and moment laws of equilibrium for various force systems, centroids, center of gravity and moments of inertia, stress and strain, riveted and welded joints, torsion, shear, bending and deflection of beams, combined stresses and columns.

MET 426. INTERNAL COMBUSTION ENGINES. Class 2, Lab. 2, cr. 3. Prerequisite: MET 200.

A study of the spark ignition, compression ignition and continuous burning internal combustion engines.

MET 485. CONTROL SYSTEMS COMPONENTS. Class 2, Lab. 3, cr. 3. Prerequisite: MET 384 or permission of the instructor.

Process control components, process characteristics, control modes, and control system analysis.

MET 495. SENIOR PROJECT SURVEY. Class 1, cr. 1.

Students will select several design projects and give written or oral reports on their proposed solutions. They will be encouraged to select and finalize one project proposal in preparation for MET 497.

MET 497. SENIOR PROJECT. Class 2, Lab. 2, cr. 3.

Directed work on individual projects for senior mechanical engineering technology students.

MET 499. MECHANICAL ENGINEERING TECHNOLOGY. Class 0-4, Lab. 0-9, cr. 1-9.

Hours and subject matter to be arranged by staff. Course may be repeated for credit.

SUPERVISION

UNDERGRADUATE LEVEL

SPV 100. SUPERVISION LECTURES. Class 1, cr. 1.

Introduction and orientation to the Department of Supervision and an overview of the supervision and personnel functions in the world of work.

SPV 252. HUMAN RELATIONS IN SUPERVISION. Class 3, cr. 3.

Study of the basis and organization of individual and group behavior. Special emphasis on typical supervisory relationships.

SPV 331. OCCUPATIONAL SAFETY AND HEALTH. Class 3, cr. 3. Prerequisite: consent of instructor.

A presentation of those aspects of occupational safety and health which are most essential to the first-line supervisor. Emphasis is placed on developing an understanding of the economic, legal and social factors related to providing a safe and healthful working environment.

SPV 332. FUNDAMENTALS OF INDUSTRIAL HYGIENE. Class 3, cr. 3. Prerequisite: SPV 331 or consent of instructor.

An examination of the industrial hygiene factors instrumental in maintaining a safe and healthful workplace. Special emphasis is given to the recognition, evaluation and control of occupational health hazards.

SPV 350. APPLIED CREATIVITY FOR BUSINESS AND INDUSTRY. Class 3, cr. 3

A study of the ways an individual can become more creative and how they can develop an environment which encourages creativity from employees.

SPV 362. COOPERATIVE OCCUPATIONAL INTERNSHIP. Cr. 3-6. May be repeated to a maximum of 24. Consent of department required.

Organized and supervised work experience toward preparation for supervisory, personnel and related positions. Planned and supervised by the departmental staff in cooperation with employing organizations.

SPV 374. ELEMENTS OF SUPERVISION. Class 3, cr. 3.

Introduction to and overview of the fundamental concepts of supervision. Emphasis is placed on the supervisor's major functions and essential areas of knowledge, his relations with others and his personal development.

SPV 375. BASIC METHODS OF TRAINING FOR SUPERVISORS. Class 3, cr. 3. Prerequisite: SPV 374 or consent of instructor.

Principles, practices, and variations of basic methods of instruction as related to training situations found in the world of work. Emphasis on the supervisor as a trainer.

SPV 376. SUPERVISION AND PERSONNEL PROBLEMS. Class 3, cr. 3. Prerequisite: SPV 374 or consent of instructor.

Analysis and discussion of selected case problems concerning typical personnel situations faced by the supervisor. Emphasis directed toward development of student attitude, philosophy, analytical ability and problem solving skills within the working environment.

SPV 462. WORK EXPERIENCE SEMINAR. Class 3, cr. 3. Prerequisite: work experience approved by department.

Class instruction and discussion related to individual participant's work experience.

SPV 474. CONFERENCE LEADERSHIP TRAINING. Class 3, cr. 3.

Understanding the role of the conference in the world of work, with practical applications of the various techniques of conference leadership, and an understanding of group dynamics in the conference situation.

DUAL LEVEL

Undergraduate-Graduate

SPV 567. SUPERVISED FIELD PRACTICE IN INDUSTRIAL TRAINING. Cr. 3.

SPV 574. MANAGERIAL TRAINING AND DEVELOPMENT. Class 3, cr. 3. Prerequisite: SPV 374 and SPV 375. Open to seniors and graduate students only.

Review of current managerial education and development theories and practices; discussion of fundamental social, economic and political changes affecting business and the work of managing; implications of these changes for individual manager development and continued growth.

SPV 577. ORGANIZATION AND ADMINISTRATION OF TRAINING AND DEVELOPMENT. Class 3, cr. 3. Prerequisite: SPV 375. Prerequisite or corequisite: SPV 574. Open to seniors and graduate students only.

The function and management of training and development in the world of work.

SPV 590. INDIVIDUAL RESEARCH PROBLEMS IN SUPERVISION AND PERSONNEL. Cr. 1-6. Consent of department required.

Opportunity to study specific problems in the field of supervision and personnel under the guidance of a qualified faculty member within the department. Does not include thesis work.

School of General Studies and Community Services

COMMUNITY SERVICES

CONTINUING EDUCATION

The Institute for Continuing Education seeks to fill the need for continuing education for Northwest Indiana citizens regardless of their previous contact with other educational institutions.

The Institute for Continuing Education is that unit of the School of General Studies and Community Services through which many non-traditional credit and non-credit courses on and off campus are directed. It draws on the full resources of the University, working closely with the faculty and participating community groups to design new programs and services to meet the needs of the community served by Purdue Calumet.

Conferences, seminars, institutes and short courses are coordinated and arranged by the Institute for Continuing Education for those who wish to continue their education by keeping informed in a variety of areas whether it be for self-enrichment or professional advancement. Members of the University faculty as well as resource personnel from the community offer instruction by lectures, discussion, demonstrations, case studies and field trips. Regular announcements regarding programs offered within the Continuing Education Program are made through the media and direct mailings to interested persons.

The University, through the Institute for Continuing Education, cooperates with organizations or groups in planning, executing and evaluating conferences and seminars which will suit the needs of the sponsoring group. Those interested in inquiring about these services should contact the Institute for Continuing Education, Purdue University Calumet, Hammond, Indiana 46323 (telephone 219-844-0520, ext. 228 or 229).

SCHOOL OF GENERAL STUDIES

The School of General Studies provides post-high school educational opportunities for students for whom such opporunities are not available elsewhere and to meet community needs in Northwest Indiana for the training of personnel. As needs for trained personnel in business, industry, government and human resources agencies are identified by the University and the community, programs are being designed in the School of General Studies which provide career ladders and new opportunities.

Students need have only a high school diploma or its equivalent to be admitted to the School of General Studies. The School of General Studies is designed for students who:

1. are in need of additional academic or skill preparation prior to entering another School,
2. are seeking university education but are undecided as to specific career objectives,
3. have well-defined objectives not represented by the degree programs in a School of the University.

The School of General Studies has designed a program to meet the needs of students who would like to enter another School of the University but do not meet the entrance requirements. This program of study will help the student meet those requirements and may, at the same time, provide him advance standing in the School of his choice.

The School of General Studies Advising Center, using the career counseling facilities of the University, will help design appropriate programs of study for students undecided about specific educational goals. These programs will permit students to take introductory courses in the field of their interest prior to making a decision on a major field.

For students with academic interests which are not represented in the degree programs at Purdue University, the School of General Studies provides the opportunity to select University courses which will be transferable to the college or university of their choice.

SCHOOL OF GENERAL STUDIES ADVISING CENTER

One of the most important services of the School of General Studies is the Advising Center. One of the keys to succeeding in college is the careful selection of courses based on past academic performance and fitted into a life that might include such responsibilities as employment or a family. A School of General Studies academic advisor will assist students in selecting the types and number of courses which will best meet their needs and maximize their potential for achieving academic success.

The services of the Advising Center are available to day and evening students. Students are required to confer with their academic advisor at least once each semester prior to registration for classes; however, students are encouraged to confer more often. The Advising Center also informs students of, and refers them to other services of the University, such as vocational and personal counseling, financial aid and tutoring. This information and referral system has proven to be particularly helpful to students in their first year of attendance at Purdue.

TRANSFER TO OTHER SCHOOLS OF THE UNIVERSITY

The School of General Studies courses and programs of study are closely related to those of the Schools of Engineering, Management, and Technology; Science and Nursing; and Humanities, Education, and Social Sciences at the Calumet Campus, and to each of the schools on the West Lafayette Campus. Many students will begin their academic careers in the School of General Studies and then transfer to another school of the University, either at the Calumet Campus, or at the West Lafayette Campus. Information about academic programs in the other schools and on other campuses of the University is available from the office of the Dean of the School of General Studies or from the student's academic advisor of the School of General Studies.

SPECIAL SERVICE COURSES

GNS 020. FUNDAMENTALS OF WRITING. Class 3, cr. 0.
A review of writing fundamentals for those who need further training and practice. Emphasis will be on English grammar, punctuation, spelling, sentence structure, and paragraph organization.

GNS 051. BASIC MATH REVIEW. Class 0, Lab. 3, cr. 0.
Individualized instruction in topics from arithmetic with whole numbers, fractions, decimals and percents. Programmed textbooks and tutorial aid from lab assistants.

UNDERGRADUATE LEVEL

GNS 100. ACADEMIC DEVELOPMENT. Class 3, cr. 3.
Designed to assist and guide students in maximizing potential for success. Information, testing and discussions involving self-awareness,

careers and academic planning assists students in making decisions as well as promotes personal growth and development. Also, emphasis placed on facilities and opportunities in university setting to enable students to achieve personal and career goals.

GNS 153. ALGEBRA AND GEOMETRY. Class 3, supervised tutoring 6, cr. 3.

An algebra and geometry class for students who lack high school credit in algebra and geometry; students who have credit in algebra and geometry, but with grades lower than C; students with credit in algebra and geometry, but no recent mathematical experience.

GNS 154. ALGEBRA AND TRIGONOMETRY. Class 3, supervised tutoring 6, cr. 3. Prerequisite: two years of secondary school mathematics or satisfactory placement test score.

An algebra and trigonometry course for technology-oriented students who have not had three years of secondary school mathematics. Not open to students with credit in MA 147, 150, 151, 153.

GNS 160. INTRODUCTION TO CHEMISTRY. Class 2, Lab. 3, cr. 3.

A survey of modern chemistry using everyday examples and contemporary experiments to illustrate the general theories and unifying concepts. The subject matter is so widely diversified that those desiring to continue will be prepared to successfully complete chemistry courses required for careers in health, agriculture, industry, energy, transportation, conservation, or other fields.

GNS 290. TOPICS FOR STUDY. Cr. 1-3.

Variable credit, variable title course for group or individual study.

School of Humanities, Education and Social Sciences

A. D. Sander, Dean

The School of Humanities, Education and Social Sciences (HESS) educates for life in a changing world through studies and experiences which lead to an understanding of human beings, their history, literature and art, their social, political and economic systems, and their relationship to the physical environment.

It provides a broad, liberal education and career preparation through courses in the humanities, education, and the social sciences for all members of the University, both in its own majors' fields, and those in other schools and functions of the University.

DEGREES OFFERED

Degrees offered in the School of Humanities, Education, and Social Sciences include: Associate of Arts, Bachelor of Arts, Bachelor of Physical Education, Associate of Applied Science in Food Service and Lodging Supervision, and Associate of Arts in Human Services: Day Care — Child. The program leading to an Associate of Arts is followed by students who desire a two-year degree which includes experience in the liberal arts and social sciences. The requirements for the A.A. degree are part of the general education requirements (CORE) for the B.A. degree. The A.A. degree program specifies a minimum involvement in the established disciplines to insure that every student will acquire skill in written communication and has exposure to the social sciences and humanities. A fifteen-hour concentration in a subject area is required to insure that the student has a concentrated experience in one area of knowledge. The program leading to the degree Bachelor of Arts is followed by students majoring in any of the fields of the humanities or the social sciences, in high school teaching in any of these fields, and in elementary education. The program leading to the degree Bachelor of Physical Education is followed by students preparing for coaching and teaching, or for athletic training. The A.A.S. in Food Service and Lodging Supervision and the A.A. in Human Services: Day Care — Child are further described in the Department of Behavioral Sciences section. Transfer between any of the four degree programs requires approval from the Office of the Dean of HESS. For example, students transferring from an Associate degree program to a Bachelor degree program must have a 4.0 graduation index over at least 12 hours of course work which is counted toward a degree in the School of HESS. Students in the A.A. degree program must complete at least 20 credits after admission to that program before receiving the A.A. degree. To receive an Associate's degree a student must earn at least a 3.9 graduation index; to receive a Bachelor's degree a student must earn at least a 4.0 graduation index. The Dean of the School may refuse to accept as credit toward graduation any course which was completed ten or more years previously. GNS 100, GNS 153, and GNS 160 do not count as credit toward graduation in the School of HESS. When all requirements are met, the Dean of the School will certify that the student's plan of study has been completed. A student can receive only one degree from the School of HESS in a 12-month period.

ASSOCIATE OF ARTS DEGREE

The plan of study for the Associate of Arts degree consists of (A) the general education requirements, (B) 15 additional credits in one subject area, and (C) 18 credits in elective courses.

A.	Required CORE:	
	1. English composition	6 semester hours
	2. Mathematics and/or Science	6 semester hours
	3. Humanities: One introductory course in each of three of the following disciplines: Aesthetics, History, Literature, Philosophy	9 semester hours
	4. Social Sciences: One introductory course in each of three of the following disciplines: Communication, Political Science, Psychology, Sociology	9 semester hours
	TOTAL FOR CORE	30 semester hours
B.	Concentration in one HESS subject area	15 semester hours
	* American History	
	* European History	
	* Foreign Language (French, German, Spanish)	
	* Foundations of Teaching	
	* Literature	
	* Philosophy	
	* Political Science	
	* Popular Culture	
	* Professional Speech Communication Skills	
	* Recreational Leadership	
	* Sociology	
	* Technical/Business Writing	
C.	Electives (Up to twelve elective credit hours may be utilized to enroll in courses in other Schools of the University.)	18 semester hours
	TOTAL CREDIT HOURS FOR ASSOCIATE OF ARTS:	63 semester hours

BACHELOR OF ARTS DEGREE

The plan of study for the Bachelor of Arts degree consists of (1) the general education requirements; (2) the requirements for the major; and (3) a sufficient number of elective courses to bring the number of semester hour credits to 126. However, 129 credit hours are required for a B.A. in Elementary Education.

The general education requirements specify a minimum involvement in several areas. They have been established in order to insure that each student has the opportunity to acquire skill in written and oral communication skills of the English language and at least one other modern language, to acquire skill in mathematics, and to have a significant experience in the humanities and the physical and social sciences.

AREA	CREDIT HOURS
Required for graduation — 126 credit hours including the following:	
A. Communications	
Writing (ENGL 103 or 100/104 and 105)	3 or 6
Interpersonal Communication (COM 114)	3
Foreign Language (12 hour sequence: 101, 102, 203, 204 or 244 in one language)	12
B. Science and Mathematics	
Twelve hours in science and mathematics with a minimum of three hours in each. No sequence required. Computer Science or Logic acceptable for mathematics.	12
C. Humanities and Social Sciences	
Twenty-four hours of which one course each shall be required in:	24
1. aesthetics	
2. economics	
3. history	
4. literature	
5. philosophy (except Logic)	
6. political science	
7. psychology	
8. sociology or anthropology	
TOTAL	54 or 57

CONCENTRATION REQUIREMENTS FOR A BACHELOR'S DEGREE

All students in a Bachelor's degree program must complete a major or area program of 24 to 45 hours. Each department specifies whether its major must be accompanied by a minor. The major or area provides the depth necessary for admission to a graduate school, to meet teacher certification requirements, or for a well rounded education. For specific degree requirements, consult the departmental sections of this catalog and/or your academic advisor.

MAJORS AND AREAS

COMMUNICATION

Speech Communication, Performance Option
Speech Communication, Interpersonal/Organizational Option
Speech Communication, Rhetoric and Social Influence Option
Speech Communication, Public Relations Option
Radio-Television

ENGLISH

English, Literature Option
English, Teaching Option
English, Writing Option

FOREIGN LANGUAGES AND LITERATURES

French
French International Studies Area
German

German — International Studies Area
Spanish
Spanish — International Studies Area

HISTORY

American History
European History

POLITICAL SCIENCE

PSYCHOLOGY

Psychology, Community Environmental Option
Psychology, Clinical Option
Psychology, Developmental Option
Psychology, General Experimental Option

SOCIOLOGY

Sociology
Sociology, Social Work Option

MINORS

Economics
English
French
German
History
Mathematics
Media Sciences
Philosophy
Political Science
Psychology
Radio and Television
Sociology
Spanish
Speech
Theater
Women's Studies

TEACHER EDUCATION REQUIREMENTS

In teacher preparation, Purdue University Calumet has been accredited by the National Council for Accreditation of Teacher Education, by the North Central Association of Secondary Schools and Colleges, and by the Indiana State Department of Public Instruction. Detailed requirements for any of the areas, majors, or minors may be obtained from the student counseling office of the school. A student who has an educational objective not covered in the list of areas, majors, or minors should consult his academic advisor.

After completion of 30 semester hours of college work, students desiring to complete an Elementary or Secondary Teaching program must apply for admission to Teacher Education. Requirements for admission and retention in Teacher Education are as follows:

Admission

1. Have a C or better in required English composition courses;
2. Complete a Speech and Hearing Analysis;
3. Have a graduation index of 4.25 or better; and
4. Appear before the Review Board.

Retention

1. Maintain a graduation index of 4.25 or better;
2. Maintain an index of 4.25 or better in any teaching major, minor, or endorsement; and
3. Attain a grade of C or better in any methods course.

Applications for admission to Teacher Education may be obtained from the Teacher Education Services Office, X-151, or the Education Office, X-122. Applications should be filed in the Teacher Education Services Office.

To facilitate completion of teacher certification requirements, students should enroll in ED 101 during their freshman year.

A student must file an application for student teaching by February 1 of the year prior to the academic year in which the student plans to do student teaching. Applications for student teaching will be accepted only from students who have been admitted to Teacher Education.

PROGRAMS FOR TEACHER CERTIFICATION
TEACHING MAJORS

- Elementary Education
  - Bilingual/Bicultural
  - Junior High/Middle School
  - Kindergarten
  - Media Sciences
  - Physical Education
  - Reading
  - Visual Arts
- English
- Foreign Languages
  - French
  - German
  - Spanish
- Health and Safety
- Media Sciences
- Physical Education
- Radio-TV
- Social Studies — one 18-hour primary and two 12-hour supporting areas from:
  - Anthropology
  - Economics
  - Geography
  - Government
  - Psychology
  - Sociology
  - U.S. History
  - World Civilization
- Speech and Theater

TEACHING MINORS

- English
- Foreign Languages
  - French
  - German
  - Spanish
- Health and Safety
- Mathematics
- Media Sciences
- Physical Education
- Science — 25-27 hours in:
  - Chemistry
  - General Science
  - Physics
- Social Studies — 15 hours in:
  - Anthropology
  - Economics
  - Geography
  - Government
  - Psychology
  - Sociology
  - U.S. History
  - World Civilization
- Speech and Theater
- Visual Arts

BACHELOR OF PHYSICAL EDUCATION DEGREE (BPE)

The general education requirements for the Bachelor of Physical Education are unique to that degree, and the number of credit hours required is 130.

AREA			CREDIT HOURS
A. Humanities			
Writing		(ENGL 103 or 100/104 and 105)	3 or 6
ENGL	185	Developmental Reading	0 to 1
COM	115	Fundmntls. of Public Speaking	3
COM	314	Advanced Public Speaking	3

	Literature	3 to 6
	Philosophy/Music/Art/Theater/Modern Language	0 to 6
B.	Life and Physical Sciences	
	BIOL 203-204	6
	Mathematics	6
	CHM 111 and 112; or PHYS 210 and 211; or CHM 111 and PHYS 210	6
C.	Social and Behavioral Sciences	
	PSY 120	3
	PSY 361	3
	Nine hours of history, political science, economics, sociology, anthropology, or general studies. (The All-Grade Major requires PSY 362 and six hours from the above listing.)	9
TOTAL:		51

ADVISORS TO STUDENTS

One of the principal services to students in the School of Humanities, Education and Social Sciences is the corps of academic advisors. Each student has a conference with an advisor before beginning classes and thereafter at least once a semester. In general, a student and advisor discuss the selection of courses for the following semester, the choice of a major, and vocational possibilites.

During the freshman year the student is assigned an advisor from the office of the dean. After choosing a major, the student is assigned to an advisor from the department of the chosen major.

PASS/NOT PASS OPTION

In order to provide students with the opportunity to broaden their educational foundations with minimum concern for grades earned, an alternate grading system, the pass/not pass option, has been established. Grades earned under this option are not used in computing grade indices. The School has established the following conditions for its students' use of the pass/not pass option:

1. Students must have a classification of three (3) or above and a graduation index of 4.0 or above to enroll in a course under the pass/not pass option.
2. Students may elect the pass/not pass grading option only in courses outside their departmental and HESS school requirements.
3. Students will indicate upon registering which courses are to be taken under the pass/not pass option. Standard registration procedures such as the rules governing drop/add, withdrawal from courses, etc., will be followed.
4. HESS students may elect courses given in other schools of the University under the pass/not pass option.
5. A student who passes a course required by HESS under the pass/not pass option while enrolled in another school in the University is considered, upon transfer to HESS, to have met the HESS requirements.

TRANSFER TO AND FROM WEST LAFAYETTE

The School's programs of study and courses are closely related to those of the School of Humanities, Social Sciences and Education (HSSE) at the West Lafayette Campus of Purdue University. The West Lafayette school is, of course, much larger and offers a wider selection of courses and majors, and since its basic mission is the same as that of HESS, it is relatively easy for students to transfer in many programs between the two schools. Many students begin their college studies at Purdue Calumet and then transfer to West Lafayette to complete a major not offered here. A large number of students who are students at the West Lafayette campus attend Purdue Calumet for summer session or for a few semesters during their college career. Academic advisors will assist in obtaining information on West Lafayette programs.

GENERAL STUDIES

A. D. Sander, in charge

UNDERGRADUATE LEVEL

Lower-Division Courses

GS 121. INTRODUCTION TO WOMEN'S STUDIES. Class 3, cr. 3.

An introduction to a women's studies perspective in various academic disciplines. Emphasis on the socialization process of women, the history and literature of women, the politics and theory of the women's rights movement, and the changing role of women in society.

GS 150. PERSONAL GROWTH AND DEVELOPMENT. Class 4, cr. 3.

A multilevel approach to the promotion of personal growth and development through a modified human relations laboratory experience. Designed also to increase learning efficiency and skills through application of basic psychological principles. Two types of activities will be employed: (1) skilled training activities and exercises; and (2) small group discussions of feelings, ideas, and relationships common to all participants.

GS 265. BY AND ABOUT WOMEN: A FEMINIST APPROACH TO LITERATURE. Class 3, cr. 3. Prerequisite: ENGL 104, 100 or 103.

Selected readings in important works of literature from a feminist perspective. Works will include several genres and be chosen from a wide range of time and places including Continental and Third World Literatures.

DEPARTMENT OF BEHAVIORAL SCIENCES

Dwight R. Kirkpatrick, Head

FACULTY: A. A. Coolidge, V. B. Damusis, W. Hartmann, J. B. Hill, E. James, D. R. Kirkpatrick, L. S. Mura, J. E. Prebis, D. Raden, R. E. Ray, T. D. Sherrard (Emeritus), A. J. Spector, M. Vajagich, V. L. Zolberg.

The Department of Behavioral Sciences offers courses in a variety of disciplines concerned with human behavior: anthropology, child care, consumer and family sciences, food service and lodging supervision, psychology, sociology, and social work. Undergraduate majors leading to the bachelor's degree are offered in clinical, community-environmental, developmental, and general-experimental psychology, and in sociology and social work. The Department administers an Associate of Arts degree program in early childhood education, which prepares nursery-school and day-care-center teachers, and a two-year program in food service and lodging supervision, leading to the Associate in Applied Science degree.

In addition to the A.A.S. degree program, the Department administers a program in consumer and family sciences designed to offer the first year or two of coursework for area students who may then transfer to the West Lafayette Campus for completion of majors in the Departments of Child Development and Family Studies, Consumer Sciences and Retailing, Foods and Nutrition, or Restaurant, Hotel, and Institutional

Management. A plan of study for the freshman year and course descriptions may be found under Transfer Programs.

ASSOCIATE OF ARTS — HUMAN SERVICES: DAY CARE — CHILD

Recognizing the direction of social change in employment patterns of families and the increased awareness of the continuity of human development, this Associate of Arts degree is designed to enlarge the understanding and improve the skills of those who plan, or are engaged in, careers in the development and care of the preschool age child. The curriculum enables students to fulfill the current (1974) Indiana state requirements for licensed day care center personnel. The graduate is qualified to hold the following positions:

1. Director of a day nursery licensed for thirty (30) children or less.
2. Head teacher in a day nursery licensed for more than thirty (30) children.
3. Assistant teacher.

Courses are designed to provide students with the training requirements to qualify for the Child Development Associate Credential.

This program fully articulates with the bachelor's degree in psychology.

Recognizing that many potential students hold day-time positions in day care centers and other areas of employment, the majority of the core courses are scheduled during the evening hours. The practicum courses (BHS 133, 233, 235, and 236) of necessity are scheduled during the day-time hours.

PLAN OF STUDY — FULL TIME

First Semester

(3) PSY 120 (Elementary Psychology)
(3) PSY 361 (Human Development I: Infancy and Childhood)
(3) BHS 231 (Introduction to Child Care)
(3) ENGL 104 (English Composition I) or ENG 100 (English Composition)
(3) COM 114 (Fundamentals of Speech)

(15)

Second Semester

(3) BHS 134 (Human Services)
(3) PSY 362 (Human Development II: Adolescence)
(3) BHS 240 (Child Guidance)
(3) BHS 232 (Techniques of Assessment)
(2) BHS 235 (Content Workshop: Seminar 1)

(14)

Third Semester

(3) BIOL 211 (The Social Impact of the Biological Sciences) or BIOL 101 (Principles of Biology) or BIOL 203 (Biology of Man)
(2) BHS 236 (Content Workshop: Seminar II)
(3) BHS 133 (Practicum in Human Service I)
(3) BHS 260 (Nutrition for Human Development)
(3) SOC 100 (Introductory Sociology)
(2) Elective

(16)

Fourth Semester

(3) BIOL 212 (The Social Impact of the Biological Sciences) or BIOL 102 (Principles of Biology) or BIOL 204 (Biology of Man)
(3) PSY 348 (Group and Human Relations)
(3) BHS 233 (Practicum in Human Service I)
(3) SOC 350 (Social Psychology of Marriage)
(3) Elective

(15)

ASSOCIATE IN APPLIED SCIENCE DEGREE IN FOOD SERVICE AND LODGING SUPERVISION.

This two-year program is designed to prepare a student to assume the responsibilities of a middle-level manager or supervisor of facilities which provide food service and lodging for large numbers of people. Examples of entry-level midmanagement positions are: airline food service supervisor, caterer, college food service director, hotel-motel manager, manufacturer's equipment sales representative, restaurant manager, and tourist director.

Students successfully completing this specialized plan of study may proceed to one of the four-year Bachelor of Science options offered by the Department of Restaurant, Hotel, and Institutional Management (RHI) in West Lafayette.

PLAN OF STUDY

First Semester

(3) ENGL 104 (English Composition I)
(1) RHI 135 (Introduction to Food Service and Lodging)
(3) F&N 203 (Foods: Selection and Preparation)
(3) MA 111 (Algebra) or higher
(3) SOC 100 (Introductory Sociology)
(3) SPV 252 (Human Relations in Industry)

(16)

Second Semester

(3) ENGL 105 (English Composition II)
(3) RHI 210 (Food Service Sanitation)
(3) F&N 303 (Essentials of Nutrition)
(3) PSY 120 (Elementary Psychology)
(3) MGMT 200 (Introductory Accounting)
(4) RHI 337 (Quantity Food Production)

(19)

Third Semester

(3) RHI 342 (Personnel Management for Restaurants, Hotels, and Institutions)
(3) ECON 210 (Principles of Economics)
(3) COM 114 (Fundamentals of Speech Communication)
(3) RHI 380 (Specialty Food Service)
(3) RHI 440 (Purchasing for Restaurants, Hotels, and Institutions)
(3) RHI 445 (Food and Labor Cost Control)

(18)

Fourth Semester

(3) RHI 320 (RHI Property Management)
(3) RHI 438 (Equipment for Restaurants, Hotels and Institutions)
(3) ENGL 420 (Business Writing) or humanities elective
(1) RHI 300 (Practicum in Restaurant, Hotel, and Institutional Management)
(3) MGMT 430 (Labor Relations)
(3) RHI 441 (Restaurant, Hotel, and Institutional Organization and Management)

(16)

BACHELOR OF ARTS DEGREE IN PSYCHOLOGY

Psychology majors have found career opportunities in mental health clinics, social welfare agencies, government, education, business and industry at the bachelor's degree level. A wider range of professional opportunities is available to psychology majors through graduate study leading to the master's and doctoral degrees. All of the four options in psychology offered at Purdue Calumet can be used as preparation for graduate work.

GENERAL PLAN OF STUDY

HESS General Education Requirements ..... 54 or 57
PSYCHOLOGY CORE requirements (all options)
PSY 302 Introduction to Quantitative Topics in Psychology II 3
PSY 303 Experimental Psychology.....3
PSY 430 Systems and Theories 3
PSY 500 Statistical Methods Applied to Psychology, Education, and Sociology.....3
TOTAL 12

Clinical Psychology Option

This important area of psychology provides the student with an understanding of psychological disorders as well as a comprehension of psychological principles which can be applied to the behavior of normal individuals.

Requirements for the Clinical Option.....21
PSY 350 Abnormal Psychology
PSY 423 Psychology of Personality
PSY 462 Field Experiences in Human Development
PSY 523 Introduction to Theories of Psychotherapy
PSY 550 Clinical Psychology
And at least two courses from:

PSY 343 Aggression and Violence
PSY 344 Human Sexuality
PSY 348 Group and Human Relations
PSY 349 Psychology of Women
PSY 361 Human Development I: Infancy and Childhood
PSY 362 Human Development II: Adolescence
PSY 363 Human Development III: Adulthood
PSY 370 Environmental Psychology
PSY 428 Drugs and Behavior
PSY 532 Psychological Disorders of Childhood

Electives or Minor 36-39

TOTAL 126

Community-Environmental Psychology Option

This option is particularly appropriate for those majors interested in a career in business or government.

Requirements for the Community Environmental Option 21
Three courses from the following:
PSY 370 Environmental Psychology
PSY 465 Field Experience in Community-Environmental Psychology
PSY 557 Psychology of Urban Environment
PSY 572 Organizational Psychology

Four courses from the following:

ANTH	341	Culture and Personality
PSY	340	General Social Psychology
PSY	348	Group and Human Relations
PSY	570	Industrial Psychology
PSY	585	Psychological Foundations of Consumer Behavior
SOC	320	General Social Organizations
SOC	334	Urban Sociology
SOC	361	The Field of Social Work
SOC	416	Industrial Sociology
SOC	530	Political Sociology
SOC	531	Community Organizations
SOC	562	Public Social Services
SOC	575	Social Gerontology

Electives or Minor 36-39

TOTAL 126

Developmental Psychology Option

This option is appropriate for those students interested in understanding the continuity of the life span and who might be considering working directly with specific age groups such as pre-school age children, adolescents, or older Americans.

Requirements for Developmental Option 21

Four courses from the following:

PSY 361 Human Development I: Infancy and Childhood
PSY 362 Human Development II: Adolescence
PSY 363 Human Development III: Adulthood
PSY 433 Issues in Developmental Psychology
PSY 462 Field Experience in Human Development

Three courses from the following:

PSY 343 Aggression and Violence
PSY 350 Abnormal Psychology
PSY 423 Psychology of Personality
PSY 428 Drugs and Behavior
PSY 532 Psychological Disorders of Childhood

Electives or Minor 36-39

TOTAL 126

General-Experimental Psychology Option

This option provides the student with a balance between basic research in psychology and the applications of that research to the understanding of human behavior.

Requirements for General Experimental Option.....21

PSY 310 Sensory and Perceptual Processes
PSY 311 Human Learning and Memory

Five courses from:

PSY 333 Motivation
PSY 340 General Social Psychology
PSY 350 Abnormal Psychology
PSY 361 Human Development I: Infancy and Childhood
PSY 423 Psychology of Personality

PSY 428 Drugs and Behavior
PSY 433 Issues in Developmental Psychology
Electives or Minor 36-39

TOTAL 126

B.A. DEGREE IN SOCIOLOGY

The study of sociology enables one to understand society and human social behavior. A career in sociology offers the opportunity to make discoveries about the social environment as well as to change the world through working in university, government agencies, social service agencies, and political action organizations.

The majority of sociologists are employed in colleges and universities as teachers and researchers. They also work in business and industry, social service agencies, research organizations, political parties, non-profit organizations, and voluntary organizations.

A doctorate is usually required for employment as a university teacher. A master's degree opens the way to a variety of positions as a social researcher. Those with bachelor degrees may be employed as interviewers, social analysts, research assistants, caseworkers, counselors, recreation workers, etc.

The two sociology options at Purdue Calumet prepare students for immediate entry into an occupation or for graduate work in sociology or social work.

General Sociology Option

This option is designed to provide a scientific understanding of the complexities of human social structure and social problems, as well as to provide skills necessary to further investigate social phenomena.

GENERAL SOCIOLOGY OPTION PLAN OF STUDY

HESS General Education Requirements ..... 54 or 57
Requirements for General Sociology Option 33
The following courses:

PSY	500	Statistical Methods Applied to Psychology, Education, and Sociology
SOC	220	Social Problems
SOC	383	Introduction to Methods of Social Research II
SOC	402	Principles of Sociology
SOC	340	General Social Psychology
ANTH		Any three credits

Any two of the following Sociology courses:

SOC	320	General Social Organizations
SOC	411	Social Stratification
SOC	525	Social Movements
SOC	530	Political Sociology

Nine additional hours in Sociology
Electives or Minor 36-39

TOTAL 126

Child and Family Services — Social Work Option

The child and family services option offers a thorough grounding in behavioral sciences while allowing the student to concentrate in social work. This option is appropriate for those who plan careers in social work, or plan to enter graduate school for a masters in social work.

CHILD AND FAMILY SERVICES PLAN OF STUDY

HESS General Education Requirements..... 54 or 57
Requirements for the Option.....43
The following courses are required:

SOC	161	Orientation to Child and Family Services
SOC	220	Social Problems
SOC	261	Introduction to Social Work
PSY	361	Human Development I: Infants and Childhood
PSY	362	Human Development II: Adolescence
SOC	361	Institution of Social Welfare
SOC	362	Child and Family Welfare
SOC	384	Field Methods and Evaluative Research
SOC	465	Social Work Strategies and Techniques
SOC	466	Human Service and Interpersonal Skills
SOC	462	Field Practicum in Social Work I
SOC	463	Field Practicum in Social Work II
PSY	500	Statistical Methods Applied to Psychology, Education, and Sociology
SOC	562	Policy Analysis of Social Service

Electives or Minor 26

TOTAL 126

Psychology Minor

A minimum of 12 semester hours is required for a minor, not including PSY 120. All minors will take PSY 303. At least nine additional semester hours will come from courses approved by the student's adviser.

Sociology Minor

For this minor the student must establish credit in SOC 100 and 220 and complete 12 additional credits in sociology courses numbered 300 or higher.

ANTHROPOLOGY

UNDERGRADUATE LEVEL

ANTH 105. AN INTRODUCTION TO CULTURAL ANTHROPOLOGY. Class 3, cr. 3.

An introduction to the science of man and his works. Emphasis on the nature of culture and culture change; relationship of culture and personality. Attention given to the variations with the "Universal" institutions of man: language, technology, the family, systems of social control, economics, warfare, religion, art, and values. Processes of invention, diffusion and acculturation; theoretical interpretations of the direction and process of cultural development.

ANTH 204. AN INTRODUCTION TO HUMAN EVOLUTION. Class 3, cr. 3. (Formerly ANTH 304)

An outline of human evolution interrelating man's changing physical characteristics with his evolving social and cultural adaptations. Man's relationships to the other primates, both physically and behaviorally are explored within an evolutionary framework. The archeological record is used to document the history of man during the last five million years. Transformations of human life initiated by the domestication of plants and animals are outlined using

archeological data from the Near East and Mexico.

ANTH 341. CULTURE AND PERSONALITY. Class 3, cr. 3. (Same as SOC 341.) Prerequisite: three hours of anthropology, sociology, child development, or psychology, or equivalent.

A cross-cultural survey stressing differing basic personality types and the process by which adult personality is acquired. Case studies of selected non-western cultures will be used to provide comparative perspective.

ANTH 414. INTRODUCTION TO LANGUAGE AND CULTURE. Class 3, cr. 3. Prerequisite: ANTH 105 or equivalent.

This course introduces undergraduate students to the anthropological view of language. Communication systems of other animals will be discussed to highlight the importance of language in the development of culture. Various theories of language and the diversity of language will be investigated. The anthropologist's view of language structure, linguistic change, and writing systems will be presented. There will be a strong emphasis on the relation of language to other aspects of culture. Non-Indo-European languages will be comparad to American English throughout the course.

ANTH 425. ANTHROPOLOGICAL ARCHEOLOGY. Class 3, cr. 3. Prerequisite: ANTH 105 and 204, or consent of instructor.

Introduction to the theory and methods of modern American archeology. Basic field and laboratory methods are placed in the context of theoretical viewpoints and problems. Major theoretical issues in the field are explored, showing the integration of American archeology with anthropology.

DUAL LEVEL
Undergraduate-Graduate

ANTH 590. INDIVIDUAL RESEARCH PROBLEMS. Cr. 1-3. Prerequisite: consent of instructor. (May be repeated for credit.)

Individual research or reading in an area of anthropology under an anthropologist staff member. Does not include thesis work.

BEHAVIORAL SCIENCES

UNDERGRADUATE LEVEL

BHS 133. PRACTICUM IN HUMAN SERVICE I. Cr. 3. Prerequisites: BHS 235 and consent of instructor.

Directed in-service training in care settings.

BHS 134. HUMAN SERVICE. Class 3, cr. 3.

A comprehensive analysis of human service settings as complex social systems composed of personalities with a wide diversity of needs. Human management and control of the cared-for, stressing human relations skills and techniques, with an emphasis on specific therapeutic and recreational activities, their applicability to periods in the life cycle.

BHS 231. INTRODUCTION TO CHILD CARE. Class 3, cr. 3. Prerequisite: PSY 361.

A survey of early childhood education and child care which places current trends and issues in historical and philosophical perspective. Includes a comparative study of theories of early childhood in existing program models; curriculum planning and teaching strategies; and how to organize a good program, including the different needs of each child and parent involvement.

BHS 232. TECHNIQUES OF HUMAN ASSESSMENT. Class 3, cr. 3. Prerequisite: PSY 361.

An advanced study of behavioral development of the young child. Assessment techniques of the child care settings and of children, observation methods, and an indepth case study of an individual child.

BHS 233. PRACTICUM IN HUMAN SERVICE II. Cr. 3. Prerequisites: BHS 133, BHS 236 and consent of instructor.

Directed in-service training in care settings.

BHS 235. CONTENT WORKSHOP: SEMINAR I. Class 1, Lab. 3, cr. 2. Prerequisites: PSY 361 and BHS 231.

Expressive/creative multimedia and music-movement-rhythms with on-site learning experiences that will demonstrate the use of a variety of activities designed to promote specific, developmentally determined facets of the child's physical, emotional, psychomotor, expressive, and social functioning.

BHS 236. CONTENT WORKSHOP: SEMINAR II. Class 1, Lab. 3, cr. 2. Prerequisites: BHS 231, BHS 235, and PSY 361.

Continuation of BHS 235.

BHS 240. APPLIED DEVELOPMENTAL CHILD CARE. Class 3, cr. 3. Prerequisite: PSY 361, and BHS 231.

An advanced study in promoting positive functioning of children and adults in a group environment and in building positive self-concept and individual strength in young children.

BHS 260. NUTRITION FOR HUMAN DEVELOPMENT. Class 3, Lab. 1, cr. 3.

Basic nutrition and its application in meeting nutritional needs as they change over the life span. Special considerations are given to food selection, legislation, and community nutrition educational programs.

BHS 290. TOPICS FOR STUDY. Cr. 1-3.

Variable credit, variable title course for group or individual study.

FOOD SERVICE AND LODGING SUPERVISION

Undergraduate Level

RHI 135. INTRODUCTION TO FOOD SERVICE AND LODGING INDUSTRY. Class 1, cr. 1.

An overview of supervisory careers, opportunities, and responsibilities in the food service and lodging industry.

RHI 210. FOOD SERVICE SANITATION. Class 3, cr. 3.

The application of sanitary and public health engineering principles to food service and lodging operations.

RHI 300. PRACTICUM IN RESTAURANT, HOTEL, AND INSTITUTIONAL MANAGEMENT. Cr. 1. Prerequisite: 15 credits in RHI or consent of head of department.

In-service training and practical experience, totaling at least 300 hours, in an approved food service and/or lodging operation.

RHI 320. RESTAURANT, HOTEL AND INSTITUTIONAL PROPERTY MANAGEMENT. Class 3, cr. 3.

The systematic internal control of hospitality spaces and equipment to safeguard public health and to utilize available aesthetic values in food and lodging environment.

RHI 337. QUANTITY FOOD PRODUCTION. Class 2, Lab. 6, cr. 4. Prerequisite: F&N 205 or 203.

Principles of quantity food production, menu planning, and merchandising with experience in each of these areas.

RHI 342. PERSONNEL MANAGEMENT FOR RESTAURANTS, HOTELS, AND INSTITUTIONS. Class 3, cr. 3. Corequisite: RHI 337.

The concepts of management of people for effective operation of restaurants, hotels, and institutions involving supervisory development and communications; the pretesting, training, and evaluating of employees and the development of attitudes and morale of people working together.

RHI 380. SPECIALTY FOOD SERVICE. Class 1, Lab. 6, cr. 3. Prerequisite: RHI 337.

Exploration and creative use of specialty foods and unusual cuisine for the hospitality field. Concepts of management for the effective operation of quantity specialty food service organizations within a financial framework involving menu-planning, customer relations, and production-service logistics.

RHI 438. EQUIPMENT FOR RESTAURANTS, HOTELS, AND INSTITUTIONS. Class 3, cr. 3. Prerequisite: RHI 337.

Principles of selection, operation, and maintenance of food service equipment including materials, structural details, design, cost, performance, and specification standards. Field trip is required.

RHI 440. PURCHASING FOR RESTAURANTS, HOTELS, AND INSTITUTIONS. Class 3, cr. 3. Prerequisite or corequisite: RHI 337.

Identifies and describes foods, supplies, equipment, furniture, and furnishings important to quantity food service. Provides methods and criteria for recognizing quality and for evaluating, specifying, purchasing, and inspecting these materials for food service use.

RHI 441. RESTAURANT, HOTEL AND INSTITUTIONAL ORGANIZATION AND MANAGEMENT. Class 2, Lab. 3, cr. 3. Prerequisite: RHI 337.

Factors involved in establishing an institution, business policies and decision making, departmental organization, administrative development including management experience; job analysis and evaluating; salary and wage structures; employee benefits; personnel selection and employment practices including allocation of labor.

RHI 445. COST CONTROLS IN FOOD SERVICE AND LODGING. Class 3, cr. 3. Prerequisites: MGMT 200 and RHI 342.

Application of cost controls; development of cost reduction methods through management policy and decisions; examination of cost control techniques for food, labor, and supplies in addition to the emphasis on beverage management control.

PSYCHOLOGY

UNDERGRADUATE LEVEL

PSY 120. ELEMENTARY PSYCHOLOGY. Class 3, cr. 3

Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, attention, perception, learning, memory, and thinking.

PSY 301. INTRODUCTION TO QUANTITATIVE TOPICS IN PSYCHOLOGY I. Class 3, cr. 3.

An introduction to the development and application of statistical, quantitative, and measurement techniques pertinent to the psychological sciences. Fundamental concepts of numerical assignment, sampling theory, distribution functions, experimental design, inferential procedures, and statistical control.

PSY 302. INTRODUCTION TO QUANTITATIVE TOPICS IN PSYCHOLOGY II. Class 3, cr. 3. Prerequisite: PSY 301 or consent of instructor.

Continuation of PSY 301. Fundamental concepts of test theory, introduction to applied psychological testing, the scaling of data, and an introduction to the mathematical models of psychological phenomena.

PSY 303. EXPERIMENTAL PSYCHOLOGY. Class 2, Lab. 2, cr. 3. Prerequisite: PSY 301 or equivalent.

The lecture portion of this course covers methodology and the philosophy of science, while the laboratory experience covers different techniques in several areas of experimental psychology.

PSY 310. SENSORY AND PERCEPTUAL PROCESSES. Class 3, cr. 3. Prerequisite: MA 151 or 153 or equivalent.

Theory, problems, and research in sensation and perception, including, physiological bases and measurement techniques.

PSY 311. HUMAN LEARNING AND MEMORY. Class 3, cr. 3. Prerequisite: PSY 301 or consent of instructor.

Theory and research in verbal learning, attention, discrimination learning, thinking, conceptual and organization processes, memory, and languages.

PSY 312. RESEARCH IN EXPERIMENTAL PSYCHOLOGY. Lab. 6, cr. 3. Should be taken concurrently with PSY 310 or 311. Prerequisite: consent of instructor. (May be repeated for credit.)

Advanced laboratory work in experimental psychology.

PSY 329. PSYCHOBIOLOGY II: PRINCIPLES OF PHYSIOLOGICAL PSYCHOLOGY. Class 3, cr. 3. Prerequisite: six hours of psychology.

The relationship of physiological information and basic anatomy, with special emphasis on the central nervous system to variables fundamental to the study of psychology.

PSY 333. MOTIVATION. Class 3, cr. 3. Prerequisite: PSY 120 or equivalent.

An examination of current research and theory in motivation. Current theories of motivation and data relevant to these theories are reviewed. The effects of both unlearned motives and rewards and learned motives and rewards on behavior are covered.

PSY 340. GENERAL SOCIAL PSYCHOLOGY. Class 3, cr. 3. (Not open to students with credit for SOC 340.) Prerequisite: three hours of psychology or of sociology.

Conditions and consequences of human behavior in social situations, with emphasis upon the mechanism and the processes on the basis of which socialization takes place.

PSY 341. RESEARCH IN SOCIAL PSYCHOLOGY. Class 2, Lab. 2, cr. 3. Prerequisites: PSY 301 and 340 (the latter may be taken concurrently).

Research techniques and laboratory work in social psychology.

PSY 343. AGGRESSION AND VIOLENCE. Class 3, cr. 3.

An intensive examination of the nature of human aggression. Among the topics covered will be: (1) theoretical perspectives concerning such behavior; (2) social conditions that encourage its performance; and (3) means for its prevention and control.

PSY 344. HUMAN SEXUALITY. Class 3, cr. 3. Prerequisite: PSY 120 or SOC 100.

A nonjudgmental approach to the study of sexuality through attempts to bring to students' awareness their own sexual values. Topics

include evaluation of research, biological aspects, varieties of expression, inadequacies, violence, love, erotica, gender identity, aging and sex laws.

PSY 348. GROUP AND HUMAN RELATIONS. Class 3, or 3. Prerequisite: six hours of psychology.

A concrete introduction to the psychology of personality, the structure and dynamics of small groups, and the formation and development of group cultures. Members constitute themselves into a self-analytic group which analyzes its own processes in relation to the personalities and roles of its members.

PSY 349. PSYCHOLOGY OF WOMEN. Class 3, cr. 3. Prerequisite: PSY 120.

An examination of the history and sources of concepts which have defined the psychological functioning of women and a critical evaluation of current evidence regarding women and their behavior, examining the influences which affect them in contemporary society, as set within the context of the life cycle.

PSY 350. ABNORMAL PSYCHOLOGY. Class 3, cr. 3. Prerequisite: three hours of psychology.

Various forms of mental disorder from the standpoint of their origin, treatment, prevention, social significance, and relation to problems of normal human adjustment.

PSY 361. HUMAN DEVELOPMENT I: INFANCY AND CHILDHOOD. Class 3, cr. 3.

A consideration of the formative years in human development with primary attention given to the processes of socialization, individualization, and adaptation, initiated by retrospective self-examination and furthered by an analysis of systematic life history data.

PSY 362. HUMAN DEVELOPMENT II: ADOLESCENCE. Class 3, cr. 3. Prerequisite: PSY 361 or equivalent.

A behavioristically-oriented analysis of social, personality, and cognitive development in adolescence and youth.

PSY 363. HUMAN DEVELOPMENT III: ADULTHOOD. Class 3, cr. 3. Prerequisite: PSY 362 or equivalent.

An analysis of growth trends in adulthood as arising from the experiences of childhood and adolescence and as manifesting themselves in the performance of a variety of adult roles. The realization of maturity, as seen in self-assessment and examination of systematic life history data. The prospects for later adulthood: involvement versus disengagement.

PSY 370. ENVIRONMENTAL PSYCHOLOGY. Class 3, cr. 3.

The psychological influence of immediate environment on human and, to a lesser extent, animal behavior. Environmental factors will be considered from the viewpoints of social psychology, applied experimental psychology, consumer psychology, community psychology, and ethology.

PSY 385. PATTERNS OF PROBLEM SOLVING. Class 3, Cr. 3. Prerequisite: At least three hours in physical or natural sciences, and three hours in mathematical or computer sciences; or consent of instructor.

Attitudes and skills for dealing with complex problems. Emphasis on formal models and human values. Alternative problem solving techniques. Practical applications in the behavioral sciences.

PSY 423. PSYCHOLOGY OF PERSONALITY. Class 3, cr. 3. Prerequisite: three hours of psychology.

The development, structure, and functioning of the normal personality.

PSY 428. DRUGS AND BEHAVIOR. Class 3, cr. 3. Prerequisite: six credits of psychology.

Discussion of the variety of drugs which affect the nervous system and behavior. Emphasis will be upon a discussion of the physiological and pharmacological bases for the use and misuse of drugs in our society.

PSY 430. SYSTEMS AND THEORIES OF PSYCHOLOGY. Class 3, cr. 3. Prerequisite: six hours of psychology.

A review of major systems of thought and theories contributing to current developments in psychology. Special emphasis placed on broad approaches to building an understanding of man, both scientific and humanistic, including behaviorism, psychoanalysis and humanistic-cognitive approaches.

PSY 433. ISSUES IN DEVELOPMENTAL PSYCHOLOGY. Class 3, cr. 3. (Formerly PSY 533.) Prerequisite: six hours of psychology.

A survey of current major issues of developmental psychology and relevant and evolving methodological approaches to these problems. The emphasis is on developmental processes and factors affecting these processes.

PSY 461. METHODS OF STUDYING HUMAN DEVELOPMENT. Class 2, Lab. 2, cr. 3. Prerequisite: PSY 363 or equivalent.

A survey of the various research methodologies and strategies used in studying all aspects of human development. Included will be such areas as experimental design, and the technology of empiricism. The course will include laboratory experience in applying the above methods and techniques.

PSY 462. FIELD EXPERIENCES IN HUMAN DEVELOPMENT. Cr. 3. Prerequisite: consent of instructor. (May be repeated once for credit with permission of instructor.)

Supervised field work experiences with persons of all ages in community settings. Intended as a

laboratory for students to integrate human development theory with practice.

PSY 465. FIELD EXPERIENCE IN COMMUNITY-ENVIRONMENTAL PSYCHOLOGY. Cr. 3 or 6. Prerequisite: PSY 370 and consent of instructor.

Supervised field work experiences in an industrial, governmental, or public service organization. Readings and class discussion to explore application of psychology to improve community life within or through the organization. Intended primarily for students in community-environmental option in psychology.

PSY 491. TOPICS IN PSYCHOLOGY. Cr. 1-6.

Variable Titles.

PSY 498. SENIOR RESEARCH. Cr. 3. (May be repeated for credit.)

Open to senior undergraduate majors in psychology. Student conducts and writes up an individual research project under the guidance of a member of the staff.

DUAL LEVEL
Undergraduate-Graduate

PSY 500. STATISTICAL METHODS APPLIED TO PSYCHOLOGY, EDUCATION, AND SOCIOLOGY. Class 3, cr. 3.

Descriptive statistics and an introduction to sampling statistics. Applied to psychological, sociological, and educational data.

PSY 505. MENTAL MEASUREMENT. Class 2, Lab. 2, cr. 3. Must be preceded by six hours of psychology, including PSY 500 or equivalent.

Introduction to the general area of mental measurement. Theory and content of measuring devices in the fields of intelligence, interests, personality, and special aptitudes.

PSY 523. INTRODUCTION TO THEORIES OF PSYCHOTHERAPY. Class 3, cr. 3. Prerequisite: introductory course in theory of personality advisable, especially for undergraduates (e.g., PSY 423).

A survey of the major approaches to psychotherapy, including their theory of illness and cure. Three traditions are represented: psychoanalytical (e.g., Freud, Adler, Jung), behavioral (e.g., Miller and Dollard, Wolpe, Stampfl), and cognitive-phenomenological (e.g., Rogers, Kelly, Perls).

PSY 532. PSYCHOLOGICAL DISORDERS OF CHILDHOOD. Class 3, cr. 3. Prerequisite: six hours of psychology.

A review of the nature, causes and consequences of deviations from normal childhood development. Emphasis is placed on the two most common types of psychological problems in childhood: mental retardation and behavior disorders.

PSY 535. PSYCHOLOGY OF DEATH AND DYING. Class 3, Cr. 3.

An examination of psychological research and theory related to death and the dying process. Topics include: 1) death concepts, attitudes, and fears — historical and contemporary, 2) definitions and predictors of death (physical, psycho-social predictors of death), effects of death on survivors, psycho-social factors related to individual differences and normative dying behaviors, stages of dying, effects of pain and drugs, managing the dying process.

PSY 550. INTRODUCTION TO CLINICAL PSYCHOLOGY. Class 3, cr. 3. Prerequisite: 12 hours of psychology.

The case-study method, including a discussion of the importance of historical information, the contribution of clinical tests to diagnosis, and a general survey of prevention and treatment techniques.

PSY 557. PSYCHOLOGY OF THE URBAN ENVIRONMENT. Class 3, cr. 3. Must be preceded by PSY 500.

Introductory course on the effects of the urban environment on human behavior. Theories and empirical studies concerning environmental stresses in the urban setting will be discussed with a major emphasis given to field studies. Implications of theory and research findings for urban planning will be specified.

PSY 565. INTERPERSONAL RELATIONS. Class 3, cr. 3.

Review of major current theoretical formulations of the interpsersonal relationship, including a discussion of the more prominent research. Focus is primarily upon two-person interpersonal relationships.

PSY 570. INDUSTRIAL PSYCHOLOGY. Class 3, cr. 3.

Survey of the applications of psychological principles and of research methodology to the various human problems in industry, such as personnel selection and appraisal, the organizational and social context of human work, the job and work situation, human errors and accidents, and psychological aspects of consumer behavior.

PSY 572. ORGANIZATION PSYCHOLOGY. Class 3, cr. 3.

A survey of basic behavioral science research and thinking as these contribute to the understanding of individual, didatic, group, intergroups and other large organization behavioral phenomena. The topics covered include motivation, perception, attitudes and morale, communication, leadership, conflict, problem solving, behavior change, and organizational effectiveness.

PSY 578. OCCUPATIONAL ANAYLSIS. Class 3, cr. 3. Prerequisite: PSY 570 or equivalent.

Survey of systematic study of human work, including techniques of analysis of jobs and occupations for personnel and related pur-

poses. Survey of occupational research and related topics. Practice in job analysis.

PSY 585. PSYCHOLOGICAL FOUNDATIONS OF CONSUMER BEHAVIOR. Class 3, cr. 3. Prerequisite: three hours of psychology.

A survey of the concepts and methods of psychology as they apply to the study of consumer behavior.

PSY 590. INDIVIDUAL RESEARCH PROBLEM. Cr. 1-3. Prerequisite: 12 hours of psychology. Admission by consent of instructor.

Opportunity for students to study particular problems in any field of psychology or initiate themselves into research techniques under the guidance of a member of the staff.

SOCIOLOGY

UNDERGRADUATE LEVEL

SOC 100. INTRODUCTORY SOCIOLOGY. Class 3, cr. 3.

A survey course designed to introduce the student to the science of human society. Fundamental concepts, description, and analysis of society, culture, the socialization process, social institutions, and social change. A first course for sociology majors and a possible terminal course for non-majors.

SOC 161. ORIENTATION TO CHILD AND FAMILY SERVICES. Class 2, Cr. 1.

An orientation to social work practice in Child and Family Services. Includes both an examination of career possibilities within the social work field and a series of field visits to local agencies. Designed to provide information which allows students to make rational decisions about their career objectives, within or outside the child and family service area. Field trips required.

SOC 220. SOCIAL PROBLEMS. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Contemporary problems at the community, society, and international levels, focusing on patterns of social organization and social change in American society, with concentration on such topics as technological militarism and war, poverty, racism, political protest, and cybernation.

SOC 261. INTRODUCTION TO SOCIAL WORK. Class 3, Cr. 3. Prerequisite: SOC 161.

Provides a basic overview of the profession of social work — its development as a profession, professional values and ethics, and the multiple settings in which social work is practiced. Instruction is given in the types of social work; i.e., the generic complex which results in individual casework, group work, community practice, administration, and policy. Methods of social work are described, along with the current frameworks for social work practice, including systems and problem solving.

SOC 315. COMPUTERS AND SOCIETY. Class 3, cr. 3. This course may *not* be used in lieu of courses in the HESS core.

The impact of computers on society and human values. Computer applications, the threat of computer regimentation, and problems of personal privacy.

SOC 320. GENERAL SOCIAL ORGANIZATIONS. Class 3, cr. 3. Prerequisite: SOC 100.

The study of selected areas of social organization. Institutions as special forms of organizations. The formal organization and bureaucracies. Theories and empirical studies of power and decision making in organizations. Case studies of American organizations and institutions.

SOC 330. CULTURE, ARTS, SOCIETY. Class 3, cr. 3. Prerequisite: SOC 100 or consent of the instructor.

The relations of the arts to society; the production, diffusion, institutionalization, democratization of the arts, with attention to the consequences of diverse media structures on organization, marketing, and support structures. Emphasis will be placed on related emerging social roles, the connections between art and politics, elite versus mass arts, and the arts and cultural values.

SOC 334. URBAN SOCIOLOGY. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Development of the city and its functions: types of social behavior in cities; influences of city life on personality; city planning.

SOC 340. GENERAL SOCIAL PSYCHOLOGY. Class 3, cr. 3. (Not open to students with credit for PSY 340.) Prerequisite: three hours of psychology or of sociology.

Social influences on the individual and processes of social interaction. Individual attitudes and behavior as related to socialization, social norms, social roles, communication and propaganda, and other social influences. Among the interaction processes considered are interpersonal attraction, influence, leadership, cooperation, and conflict.

SOC 350. SOCIAL PSYCHOLOGY OF MARRIAGE. Class 3, cr. 3. Prerequisite: SOC 100 or 312, or equivalent. (Not open to students who have had CDFL 350.)

Designed to provide an understanding of contemporary courtship, marriage, and family interaction as cultural, social, and social-psychological phenomena. Consideration of the major sources of marital strain and conflict within a heterogeneous, rapidly changing society.

SOC 361. THE FIELD OF SOCIAL WORK. Class 3, cr. 3. Prerequisite: SOC 100 or 312 or equivalent.

Basic concepts and activities of social service organizations. Field trips to selected institutions.

SOC 362. CHILD AND FAMILY WELFARE. Class 3, Cr. 3. Prerequisites: SOC 261, PSY 361, and PSY 362.

A review of the family as it is influenced by societal and personal forces. The impact of culture, society, and economics on the family is reviewed: additionally, the personal and interpersonal factors, including family crises, breakdowns, unemployment, and alcoholism, are considered.

SOC 382. INTRODUCTION TO METHODS OF SOCIAL RESEARCH I. Class 3, cr. 3. Prerequisite: six hours of sociology.

Introduction to the basic techniques of statistical analysis applicable to sociological data. Elementary descriptive statistics and statistical inference. Introduction to multivariate analysis.

SOC 383. INTRODUCTION TO METHODS OF SOCIAL RESEARCH II. Class 3, cr. 3. Prerequisite: SOC 382.

Introduction to the methods of data collection and analysis and to the use of the scientific method in social research. Formulation of hypotheses and research designs for their testing. Elementary principles for the conduct of experiments, observation, and interviewing, documentation; content analysis; and surveys. Relationship between social research and social theory.

SOC 384. FIELD METHODS AND EVALUATIVE RESEARCH. Class 3, Cr. 3. Prerequisite: PSY 500 or equivalent.

Examines purposes and types of evaluation research both in practical and theoretical problems. Emphasis on application of evaluative strategies and field situations such as social services, health services, criminal justice agencies, and business, and the collection, analysis, reporting, and utilization of evaluative data.

SOC 385. PATTERNS OF PROBLEM SOLVING. Class 3, Cr. 3. Prerequisite: At least three hours in physical or natural sciences, and three hours in mathematical or computer sciences or consent of instructor.

Attitudes and skills for dealing with complex problems. Emphasis on formal models and human values. Alternative problem solving techniques. Practical applications in the behavioral sciences.

SOC 402. PRINCIPLES OF SOCIOLOGY. Class 3, cr. 3. Prerequisite: nine hours of sociology.

An advanced critical treatment of the theories, concepts, and methods of sociology. A basic course required of undergraduate majors in sociology.

SOC 411. SOCIAL STRATIFICATION. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Examination of systems of class and caste, with special attention to the United States; status, occupation, income, and other elements in stratification.

SOC 412. SOCIAL CHANGE. Class 3, cr. 3. Prerequisite: SOC 100 or the consent of the instructor.

The study of social change in premodern and modern societies. The following topics will be included: theories of social change, current patterns of social change, current patterns of social change in the developing and industrial worlds, changes in socialization patterns, interpersonal relations, social institutions, the impact of social change, the desirability of growth and development and the dilemmas of modernization.

SOC 416. INDUSTRIAL SOCIOLOGY. Class 3, cr. 3. Prerequisite: SOC 100, or equivalent.

Interpersonal relations within factories and other work organizations, and relations between leadership behavior, satisfaction, and productivity; technological influences on work group behavior; line-staff relations and union-management relations.

SOC 421. JUVENILE DELINQUENCY. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

A study of social and psychological factors influencing individual delinquent behavior patterns. Emphasis on preventive and rehabilitative programs and the role of community agencies, such as social service agencies, juvenile courts, youth authorities. Visits to selected organizations and institutions.

SOC 422. CRIMINOLOGY. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Nature and cause of crime; methods of dealing with adult and juvenile offenders; consideration of present programs for the social treatment of crime in the light of needed changes.

SOC 462. FIELD EXPERIENCE IN SOCIAL WORK. Class 1, Lab. 6, cr. 4.

Observation and supervised participation in local social welfare agencies. Readings and class meetings to integrate theory and experience. Intended for students who wish to enter graduate school of social work or who plan to become employed in a public welfare agency upon receiving the bachelor's degree.

SOC 463. FIELD PRACTICUM IN SOCIAL WORK II. Cr. 5. Prerequisite: SOC 462.

Continuation of SOC 462. Provides an expanded field experience and a seminar for integration of theory with practice. This course requires a minimum of twelve hours of field work per week.

SOC 465. SOCIAL WORK STRATEGIES AND TECHNIQUES. Class 3, Cr. 3. Prerequisite: SOC 261. Strongly recommend enrollment concurrent with SOC 462.

Emphasis on preparing students for the multiple roles and functions attending social work. Strategies for gathering, organizing, and interpreting social work information, preparation of reports, coordination of referrals and services. Instruction in effective social work techniques.

SOC 466. HUMAN SERVICES AND INTERPERSONAL SKILLS. Class 3, Cr. 3. Prerequisite: SOC 462 or consent of instructor. Strongly recommend enrollment concurrent with SOC 463.

This course provides a concrete introduction to principles of interpersonal relations in the field of human services. These principles are approached inductively, using field work experiences as a basis for group-based self-analysis and reflection.

SOC 491. TOPICS IN SOCIOLOGY. Cr. 1-6.

Variable titles.

DUAL LEVEL
Undergraduate-Graduate

SOC 514. RACIAL AND CULTURAL MINORITIES. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

America's minority groups; immigration; interracial and intercultural conflicts; assimilation.

SOC 515. BLACK AMERICANS. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

The status of Blacks in contemporary American society in the context of dominant-minority group relations. Current attitudes and ideological orientations; education and school desegregation; housing and residential segregation; the Black family; the socio-economic status of Blacks; civil rights groups and their approaches to inequality; and prospects for the future.

SOC 520. SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS. Class 3, cr. 3. Prerequisite: SOC 100, 312 or equivalent.

An examination of occupations and professions in the contemporary United States in terms of occupational choice, socialization into the occupation, career, patterns, social control, and the politics of occupational associations.

SOC 525. SOCIAL MOVEMENTS. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Origins and developmental stages of revolutionary and reform movements and communitarian societies; relation between social structure and political attitudes; personality needs and affinity for social and political ideologies.

SOC 530. POLITICAL SOCIOLOGY. Class 3, cr. 3. Prerequisite: SOC 100, 312 or equivalent.

Analysis of the social and social psychological sources of routine political participation such as voting and interest group activity and nonroutine political action such as protest movements and revolution; the organization of power at the community, national, and international level; and political ideology.

SOC 531. COMMUNITY ORGANIZATION. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Analysis of the local community in terms of its institutional structure, relationships among institutions, political and economic power relationships, and the role of voluntary organizations and interest groups.

SOC 541. INTERPERSONAL RELATIONSHIPS IN GROUPS. Class 3, cr. 3. Prerequisite: SOC 340 or equivalent or consent of instructor.

Examines structure and processes of social interaction in groups of all sizes, focusing on small groups. General approaches to understanding and improving group functions are considered. Specific topics include leadership, cooperation and conflict, conformity and deviance, and effective problem-solving. Examples are drawn from diverse settings such as schools, industry, family, and community.

SOC 550. GENDER IDENTITY AND SEX ROLE DIFFERENTIATION. Class 3, cr. 3. Prerequisite: SOC 350 or 450, or consent of instructor.

Psychosexual differentiation, both prenatal and postnatal; normal and deviant processes involved in establishing gender identity and in functioning within a sex role setting. Some attention to hermaphroditism, transsexualism, and homosexuality. The masculinity-feminity dimension of personality; sex role structures and sex role learning within a societal context. A companion course to SOC 450.

SOC 553. THE SOCIOLOGY OF THE FAMILY. Class 3, cr. 3. Prerequisite: SOC 100, 312 or equivalent.

The family as an ongoing institution, subject to forces such as culture, economics, social class, religion, and education, which affect family structure and internal familial processes of social control and integration. Consideration of the means by which the family effects changes in other institutions and in individuals. Use of historical data to augment study of current changes in family structure and functions.

SOC 562. PUBLIC SOCIAL SERVICES. Class 3, cr. 3. Prerequisites: SOC 100, 312, or equivalent.

Activities and responsibilities of governmental agencies in meeting social needs. Emphasis on changing philosophies and changing social values, together with their implementation into these services.

SOC 570. SOCIOLOGY OF EDUCATION. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

Analysis of the American public school as a social organization. Includes: interrelations among community power structure, social stratification, and the school; the roles of superintendent, principal, and teacher in community and school; the classroom as a social system; student culture; and teaching as a profession.

SOC 572. RELIGION IN AMERICAN SOCIETY. Class 3, cr. 3. Prerequisite: SOC 100, 312 or consent of instructor.

Examination of organized religion in America, including beliefs and practices of major American faiths, inter-faith images, dimensions and consequences of religious involvement, types of church structure, churches as community organizations, intergroup conflict, and types of ecumenical activity.

SOC 575. SOCIAL GERONTOLOGY. Class 3, cr. 3. Prerequisite: SOC 100 or equivalent.

An examination of the basic points of view and a review of the accumulated body of knowledge specific to gerontology. Consideration of the problems of population change, housing, social adjustment, retirement, mobility, family living arrangements, and finances of older persons in the United States. Comparison with other countries.

SOC 590. INDIVIDUAL RESEARCH PROBLEMS. Cr. 1-3. Prerequisite: consent of instructor. (May be repeated for credit.)

Individual research or reading in an area of sociology under a sociology department staff member. Does not include thesis work.

SOC 591. SELECTED TOPICS IN SOCIOLOGY. Cr. 1-3. Prerequisite: SOC 100 or equivalent. (May be repeated for a maximum of six credit hours.)

DEPARTMENT OF COMMUNICATION AND CREATIVE ARTS

Edwin Cohen, Head

FACULTY: K. P. Bacus, Y.S.Chambers, E. Cohen, M. Dakich, M. E. Dixon, D. M. Dunn, L. R. Goodman, J. L. Leslie, M. G. Martin, J. A. Mohamed, W. L. Robinson, S. L. Sebok.

The Department of Communication and Creative Arts provides a broad spectrum of curricula and classes ranging from the behavioral sciences to performing and creative arts. Many of the curricula are vocationally-oriented with students having the opportunity to choose a field of study for a liberal arts education, for professional training, for general humanitarian education, or for a creative, artistic supplement to their regular course of study. The department offers courses in speech-communication, rhetoric, oral interpretation, radio and television, speech science, journalism, art and design, music, and theatre.

Curricula within the department include four Bachelor of Arts degrees: Speech Communication, Speech Teaching, Radio and Television, and Radio and Television Teaching; and four minors: General Speech, Speech Teaching, Theatre, and Visual Arts Teaching.

Speech Communication Major

The Speech Communication Major does not require a minor, although one may be advisable.

Department requirements are as follows:

I. The following courses are required of all Speech Communication Majors: eighteen (18) hours of the following courses: COM 115; 214; 318; 225; 343 or 314; and 320 or 250;

II. A total of fifteen (15) hours from one of the following emphases is also required:

A. Performance Emphasis:
Required (nine hours): COM 210, 213, and 343* or 314; choose six hours: COM 254; 344; 345; 346; 440; 441, 545; THTR 230 or 330 with THTR 136 or 168; or THTR 340;

B. Interpersonal/Organizational Communication Emphasis:
Required (twelve hours): COM 320; 325; 420; and PSY 301 or SOC 382. Choose three hours: COM 413, 508, 512, or 350.

C. Public Relations Emphasis:
Required (nine hours): COM 253, 530, and 252 or 536; choose three hours from: COM 210, 213, 254, or 323 and three hours from COM 250, 330, 355, 452, or 537.

D. Rhetoric and Social Influence Emphasis:
Required (six hours): COM 312, 425; choose six hours from COM 210, 213, 343 or 314, and 330; choose three hours from COM 316, 405, 491, 514, and 519.

Speech Communication and Theater Teaching Major

The Speech Communication and Theater Teaching Major shall consist of 42 hours of course work distributed as below. It can be coupled with any minor and provides certification in Secondary Education in the state of Indiana.

The holder of the Speech Communication and Theater Teaching Major or Minor is eligible to teach mass media, speech, and dramatics in grades 9-12 when the basic preparation level is Secondary Education.

Requirements: 42 hours from the list below and 25 hours of professional education requirements. (Institutional requirements are to be met including 42-57 hours.)

COM 115, 130, 210, 213, 214, 232, 314, 320, 343*; THTR 255, 340; AUS 210.

Six hours chosen from: THTR 230; COM 250, 318, 344, 345, 346, 537.

Radio-Television Major

This major must be accompanied by a minor other than communication. Department requirements are as follows:

A. COM 130, 254, 331, 332, and 250 or 330.

B. One of the following courses: COM 214, 318, 320, or 325.

C. Twelve hours chosen from the following courses in COM and ENGL: COM 213, 252, 253, 333, 343, 352, 355, 431, 432, 433, 530, 531, 532, 534, 536, 537, 225; ENGL 376 or 386 or 387.

*Satisfies Core aesthethic requirement.

Radio-Television Teaching Major

Requirements:
A. COM 130, 250, 254, 331, 332, 333, 352, 532, 536, 537;
B. One of the following: COM 214, 318, 320, or 325;
C. Two of the following: COM 213, 225, 252, 253, 330, 343, 355, 421, 432, 433, 530, 531, 534; ENGL 376, 386, or 387.

General Speech Minor

The requirements for this minor are any twelve (12) hours taken from courses with a COM prefix.

Visual Arts and Crafts Teaching Minor

Candidates for the Visual Arts and Crafts Teaching Minor must complete 24 hours beyond the 102 level.

Requirements:
A. Drawing, Design, Appreciation: A&D 106, 113, 202, 355.
B. Two Dimensional Area — two of the following: A&D 200, 265, 225, 207.
C. Three Dimensional Area — two of the following: A&D 264, 361, 242, 374.

Theatre Minor

The requirements for this minor are as follows:
A. Nine (9) hours of THTR 255, 340, and 570 or 571;
B. At least five (5) hours of other courses with the THTR prefix.

Speech Teaching Minor

The requirements for this course are as follows:
A. Three (3) hours chosen from COM 210, 314, 318, and 320;
B. Three (3) hours chosen from COM 250 or 537;
C. Three (3) hours chosen from COM 343 or THTR 201;
D. Twelve (12) hours chosen from any other courses with a COM prefix (except 114 and courses in journalism) including those listed above and/or courses with a THTR prefix).

In addition, EDUC 418 is required.

AUDIOLOGY AND SPEECH SCIENCES

UNDERGRADUATE LEVEL

AUS 210. INTRODUCTION TO COMMUNICATIVE DISORDERS. Class 3, cr. 3.
Nature, symptoms, and causes of communication disorders and the principal methods used for remediation.

AUS 301. PHONETICS: THEORY AND APPLICATION. Class 3, cr. 3.
Phonetic basis of speech sounds; broad transcription; standards which influence pronunciation, including observation and representation; ear training and practice in transcription.

COMMUNICATION

UNDERGRADUATE LEVEL

COM 114. FUNDAMENTALS OF SPEECH COMMUNICATION. Class 3, cr. 3.

A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion, to informative and persuasive speaking in standard speaker-audience situations.

COM 115. FUNDAMENTALS OF PUBLIC SPEAKING. Class 2, Lab. 2, cr. 3.

The focus of the course is on the preparation, organization, and oral delivery of messages to audiences in practical situations encountered in professional life.

COM 130. INTRODUCTION TO ELECTRONIC MEDIA. Class 3, cr. 3.

Origin, development, nature, and function of Radio and Television in America.

COM 210. DEBATING PUBLIC ISSUES. Class 3, cr. 3. Prerequisite: COM 114.

Study of argumentation as applied to public discourse. Lectures on logic and reasoning, library research methods, and bibliography, identification and analysis of issues, construction and organization of cases, refutation and rebuttal, and the phrasing and delivery of the argumentative speech. Preparation of debate cases.

COM 211. PRACTICUM IN SPEECH COMMUNICATION ACTIVITIES. Lab. 2, cr. 1, or Lab. 4, cr. 2. Prerequisite: consent of instructor. (May be repeated for credit, maximum total four credits.)

Training in the theory and techniques of intercollegiate forensics, participation in competitive events, and public presentations.

COM 213. VOICE AND DICTION. Class 3, cr. 3. Prerequisite: COM 114.

A course designed to assist the student in voice and speech improvement; and to cultivate an ear which hears critically oneself and others produce speech sounds. Heavy emphasis on practice and improvement through lab sessions.

COM 214. COMPARATIVE THEORIES OF INTERPERSONAL COMMUNICATION. Class 3, cr. 3. Prerequisite: COM 114.

Introduction to the contemporary theories of interpersonal communication, with particular focus on the implications of the theories for the process of interpersonal and intrapersonal communication. Investigation and comparative analysis of rhetorical theories, linguistic theories, behavioral theories, quantitative theories and psychological theories will be emphasized, as will be construction and analysis of models of communication.

COM 225. INTRODUCTION TO RHETORIC AND SOCIAL INFLUENCE. Class 3, cr. 3. Prerequisite: COM 114.

A study of rhetoric as an agent of social change. Analysis of strategies and techniques of non-oratorical as well as oratorical forms of contemporary rhetorical situations.

COM 241. PRACTICUM IN ORAL INTERPRETATION. Lab. 2 or 4, cr. 1 or 2. Prerequisite: consent of instructor. (May be repeated for credit; maximum total four credits.)

Practical training and experimentation in individual and ensemble oral interpretation.

COM 250. MASS COMMUNICATION AND SOCIETY. Class 3, cr. 3.

A survey of the print, broadcast and film media in their relationship and influence on society. Study topics include: mass communication theories, documentaries, commercialism, news media, media effects and control, feedback, educational broadcasting, and audience analysis.

COM 253. INTRODUCTION TO PUBLIC RELATIONS. Class 3, cr. 3. Prerequisite: either COM 250 or 115.

Theories, methods, and practice of public relations; their application in industry, government, education, social agencies, and other institutions.

COM 254. RADIO AND TELEVISION PERFORMANCE. Class 1, Lab. 4, cr. 3. Prerequisite: COM 114 and 130 or consent of instructor.

Study and practice in radio and television communication, continuity, news, interview, discussion, music, commercials, drama; basic voice instruction and technical orientation.

COM 255. INTRODUCTION TO NEWS WRITING AND EDITING. Class 3, Lab. 1, Cr. 3.

Fundamentals of gathering, evaluating, writing, and editing news. (Basic typing ability desirable.)

COM 312. RHETORIC IN THE WESTERN WORLD: HISTORICAL PERSPECTIVES. Class 3, cr. 3. Prerequisite: COM 114 or equivalent.

A survey of major European rhetoricians, such as Aristotle and Quintilian, and speaking events from 500 B.C. to 1900 A.D. Rhetorical theory and oratorical practice are related to each other and to the social development of Western civilization.

COM 314. ADVANCED PUBLIC SPEAKING. Class 3, cr. 3. Prerequisite: COM 115.

Development of a marked degree of skill in the composition and delivery of various types of speeches; special emphasis on speeches related to the student's major vocational area.

COM 315. SPEECH COMMUNICATION OF TECHNICAL INFORMATION. Class 3, cr. 3. Prerequisite: COM 114. Open only to students enrolled in the Departments of Technology.

The organization and presentation of information of a practical technical nature. Emphasis is placed upon the study, preparation, and use of audio-visual materials in such presentations.

COM 316. THE ROLE OF SPEAKING IN MAJOR AMERICAN CONTROVERSIES. Class 3, cr. 3. Prerequisite: COM 114 or 318 or consent of instructor.

Analysis of selected speeches and debates in major American controversies of social significance. Speeches are examined to locate value premises and persuasive techniques, leading to definitions of terms such as "free speech," "orator," and "demogogue."

COM 318. PRINCIPLES OF PERSUASION. Class 3, cr. 3. Prerequisite: COM 114 or consent of instructor.

Persuasion and its effects on behavior with emphasis on evidence and reasoning and on emotional and personal proof; practice in critical reception as well as effective composition of persuasive discourse.

COM 319. THE RHETORICAL TRADITION. Class 3, cr. 3.

An historical survey of major rhetorical theory as it relates to the development of Western civilization, with major emphasis on Aristotle and the "New Rhetoric."

COM 320. GROUP DISCUSSION AND CONFERENCE LEADERSHIP. Class 3, cr. 3. Prerequisite: COM 114.

A study of group thinking and problem-solving methods; participation in and evaluation of committee and informal discussion groups.

COM 322. LEADERSHIP IN ORGANIZATIONS. Class 2, Lab. 2, cr. 3. Prerequisite: COM 114 or consent of instructor.

The development of leadership skills necessary for participation in organizations. Emphasis on feedback, empathy, and trust as contribution to effective communication within organizations. The course includes observation of communication in a public, private, or student organization.

COM 323. BUSINESS AND PROFESSIONAL SPEAKING. Class 3, cr. 3. Prerequisite: COM 114.

The study of oral communication problems and responsibilities in the business-organizational environment. Participation in problem-solving from investigation and informative speaking to advocacy and parliamentary debate.

COM 325. INTERVIEWING: PRINCIPLES AND PRACTICE. Class 3, cr. 3. Prerequisite: COM 114.

Theory and practice of methods in selected interview settings; informational, employment, and persuasive. Emphasis on communication between two persons, questioning techniques, and the logical and psychological bases of interpersonal persuasion.

COM 330. THEORIES OF MASS COMMUNICATION. Class 3, cr. 3.

An examination of mass communication theories and theorists. Readings and discussion of McLuhan, Lippman, LaFleur, Lazarsfeld, Schramm, Stephenson, and other significant contributors.

COM 331. RADIO PRODUCTION. Class 1, Lab. 4, cr. 3. Prerequisites: COM 250 and consent of the instructor.

Basic principles of producing, directing, and writing for radio. Treats program types, production methods, techniques of the sound studio, principles of directing radio programs, and laboratory practice in production and direction.

COM 332. TELEVISION PRODUCTION. Class 1, Lab. 4, cr. 3. Prerequisites: COM 250 and consent of instructor.

Basic principles of producing, writing, and directing for television. Production and direction of television programs at the Purdue Television Unit. Treats program types and television criticism, and explores creative treatment of visual, artistic, and nonverbal elements of communication in television.

COM 333. FILM PRODUCTION. Class 2, Lab. 2, cr. 3. Prerequisites: COM 250 and consent of instructor.

Basic theory and techniques of motion picture production. Viewing and evaluation of films illustrating a variety of film techniques. Production experiences in filming, scripting, editing, sound recording, and production planning.

COM 343. FUNDAMENTALS OF ORAL INTERPRETATION. Class 2, Lab. 2, cr. 3. Prerequisite: COM 114. (Not available to students with credit in COM 240.)

A study of basic theories of oral interpretation including the analysis and presentation of literature.

COM 344. ADVANCED INTERPRETATION: POETRY: Class 2, Lab. 2, cr. 3. Prerequisite: COM 240, COM 343 or consent of the instructor. (Not available to students with credit in COM 340.)

Advanced theories and analytical concepts of interpretation dealing only with poetic literature.

COM 345. ADVANCED INTERPRETATION: PROSE. Class 2, Lab. 2, cr. 3. Prerequisite: COM 343, or equivalent. (Not available to students with credit in COM 341.)

Advanced theories and analytical concepts of interpretation dealing only with prose literature and focusing on dialogue and narration.

COM 346. ADVANCED INTERPRETATION: DRAMA. Class 2, Lab. 2, cr. 3. Prerequisite: COM 343, or equivalent. (Not available to students with credit in COM 342.)

Advanced theories and analytical concepts of interpretation dealing only with dramatic literature: the play, dialogue, monologue.

COM 350. INTERRACIAL COMMUNICATION. Class 3, cr. 3. Prerequisites: COM 114 and consent of instructor.

Analysis of problems and solutions in interracial communication. Investigation of negative attitudes and other barriers impeding interethnic communication, especially between whites and blacks. Use of model communicative situations in interracial dialogue.

COM 352. MASS COMMUNICATION LAW. Class 3, cr. 3.

Study of Anglo-American traditions and trends, as well as current American conditions of the laws of libel, privacy, fair comment and criticism, privilege, property rights, and copyright as such factors affect the print journalist and the broadcaster. Emphasis is on existing state and federal regulations and precedents.

COM 355. FUNDAMENTALS OF ADVERTISING. Class 3, cr. 3. Prerequisite: COM 230 or 250, or consent of the instructor.

Theory and practice of advertising in the mass media, with emphasis on the newspaper and the magazine.

COM. 357. HIGH SCHOOL PUBLICATIONS. Class 3, cr. 3.

Study of the functions, mechanics, and writing techniques of high school newspapers and yearbooks. A survey of editorials, business, and production aspects of student publications with some news writing assignments. Instruction in teaching high school journalism. Recommended for prospective teachers of English.

COM 371. HEALTH COMMUNICATION. Class 3, Cr. 3. Prerequisite: COM 114 or consent of instructor.

Exploration of the communication competencies needed by health care professionals (doctors, dentists, nurses, social workers, therapists, etc.) in the performance of their health care tasks. The course will emphasize helper-helpee interviewing, verbal and nonverbal skills, group interaction, intercultural communication, health care organizations, and therapeutic communication.

COM 405. THE RHETORIC OF WOMEN'S RIGHTS. Class 3, cr. 3. Prerequisite: COM 114.

An analysis of the major arguments and persuasive techniques used in the American women's movement, beginning with the suffrage movement and continuing through the current struggle for equal rights. Included will be major speeches as well as non-oratorical forms of rhetorical messages.

COM 413. ATTITUDE FORMATION IN INTERPERSONAL COMMUNICATION. Class 3, cr. 3. Prerequisite: COM 214 or 318.

The study of perception and interpersonal orientations in the process of attitude formation in interpersonal communication. Emphasis on trust, hostility and anxiety, as factors influencing effective communication. Lectures, discussion, and laboratory exercises.

COM 415. DISCUSSION OF TECHNICAL PROBLEMS. Class 3, cr. 3. Prerequisite: COM 315. Open only to students in the Departments of Technology.

Principles of speech communication related to interpersonal and group discussions on technical topics and problems; practice in using these modes in situations typically encountered by the technologists.

COM 420. ORGANIZATIONAL COMMUNICATION. Class 3, cr. 3. Prerequisite: COM 320.

Examination of the communication concepts and practices related to the function and success of organizations. Formal and informal channels will be analyzed on the basis of use, source content, potency and trustworthiness. Readings and analyses will focus on goals, reliability and applicability appropriate of organizational settings. Types of organizations to be studied will include industrial "giants," governmental agencies, social and educational administrative bodies, and formal task groups.

COM 425. RHETORICAL CRITICISM. Class 3. cr. 3. Prerequisite: COM 225.

A comparative study of the writings on traditional and contemporary rhetorical criticism. Students will have an opportunity to describe, analyze, interpret, and evaluate persuasive discourse.

COM 430. BROADCAST SALES. Class 3, Cr. 3. Prerequisite: COM 130.

An examination of broadcasting time sales incorporating the study of the meaning and use of rating data, rate cards and advertising practices. Fund raising in public broadcasting will also be examined. Special emphasis on the use of sales tools and techniques.

COM 431. PRACTICUM IN RADIO. Class 1, Lab. 2, cr. 2. Prerequisites: COM 331 and consent of instructor. (May be repeated once only for credit.) Assigned radio program production.

COM 432. PRACTICUM IN TELEVISION. Class 1, Lab 2, cr. 2. Prerequisite: COM 332 and consent of instructor. (May be repeated once only for credit.)

Assigned television program production.

COM 433. PRACTICUM IN FILM. Class 1, Lab. 2, cr. 2. Prerequisites: COM 333 and consent of instructor. (May be repeated once only for credit.)

Assigned production in cinematography.

COM 440. READERS THEATRE. Class 2, Lab. 2, cr. 3. Prerequisite: COM 240, 343 or equivalent.

A study of the history, theories, and styles of group oral presentation of literature. Emphasis is placed on experimentation and creativity in styles of presentation and in analytical insights into literature.

COM 452. PRACTICUM IN JOURNALISM. Class 1, Lab. 2, cr. 2. Prerequisites: COM 252 or 255 and consent of instructor. May be repeated for credit.

Assigned projects in journalism.

COM 491. SPECIAL TOPICS IN COMMUNICATION. Variable pattern; variable credit, 1-6.

DUAL LEVEL

Undergraduate-Graduate

COM 504. DEVELOPMENT AND PROBLEMS OF SPEECH EDUCATION. Class 3, cr. 3. Prerequisite: consent of instructor.

Study of the evolution of content and method in the teaching of speech from classical and European roots to the present; special attention to the influences of great teachers, schools, movements, books, and events.

COM 508. NONVERBAL COMMUNICATION IN HUMAN INTERACTION. Class 3, cr. 3. Prerequisite: consent of instructor.

An examination of theoretical writings and critical research studies in selected areas of nonverbal study — e.g., the environmental influences, space and territory relationships, physical behavior, and vocal cues. One unit will specifically concern itself with measurement, recording, or transcription methods used in nonverbal study.

COM 511. DEVELOPMENT AND DIRECTION OF FORENSIC PROGRAMS. Class 3, cr. 3. Intended primarily for advanced undergraduates and students pursuing master's degrees. Admission by consent of instructor.

Study of the philosophy and role of various forensic activities in speech education; recent trends and practices in co-curricular and extracurricular programs; critical evaluation of related research.

COM 512. THEORIES OF INTERPERSONAL COMMUNICATION. Class 3, cr. 3. Prerequisite: COM 214 or consent of instructor.

Review of contemporary theories, analysis of concepts, models, and pertinent research across the broad spectrum of interpersonal communication.

COM 514. THE RHETORIC OF CONFLICT AND COMPROMISE: HISTORICAL PERSPECTIVES. Sem. 1 or 2. Class 3, cr. 3. Prerequisite: COM 318 or consent of instructor.

An examination of the role persuasion has played historically as a means of reaching accommodation in times of social change. Includes case study examinations of how rhetorical behavior is used to define and arbitrate national and international differences. Attention is given to such topics as the American Revolution, the Compromise of 1850, the Civil War, Imperialism, and the Arab-Israeli Conflict. Staff.

COM 519. THE RHETORIC OF AMERICAN AGITATION. Class 3, cr. 3.

An investigation of agitational rhetoric comprising social, political, and economic protest. Special emphasis is placed upon the rhetoric strategies of agitators, such as Samuel Adams, David Walker, Charles Redmond, Johann Most, William Lloyd Garrison, Abbie Hoffman, H. Rap Brown, Stokely Carmichael, and Malcolm X.

COM 530. BROADCAST JOURNALISM. Class 2, Lab. 2, cr. 3. Prequisite: COM 130 or consent of instructor.

The history and practice of broadcast journalism, with group and individual projects in various forms of broadcast journalism: straight news, feature reports, commentary, editorial, interview, and documentary.

COM 531. PROBLEMS IN CONTEMPORARY BROADCASTING. Class 3, cr. 3. Prerequisites: COM 130 or consent of the instructor.

Critical analysis and evaluation of current and continuing social problems in both commercial and public broadcasting, with emphasis upon audience analysis and recent studies dealing with media effects.

COM 532. BROADCAST MANAGEMENT. Class 3, cr. 3. Prerequisites: COM 130 or consent of the instructor.

A study of problems of organization and management of radio and television stations — both commercial and public — with emphasis upon economic factors as well as on the interrelationships of various departments. Special problems related to programming, production, sales, public relations, CATV, audience, governmental regulation, current and future trends will be treated.

COM 534. COMPARATIVE BROADCAST SYSTEMS. Class 3, cr. 3. Prerequisite: COM 250 or consent of instructor.

Historical, sociological, and political aspects of various systems of broadcasting throughout the world. Examination of American, Canadian, British, French, German, Soviet, and other broadcast institutions to discover why and how they are regulated and what impact they have on political, social, and economic development.

COM 536. RADIO AND TELEVISION WRITING. Class 3, cr. 3. Prerequisite: COM 130 or consent of instructor.

Study of forms and materials suitable for both media; practice in selection, adaptation, and organization of special program materials; special uses of media in education.

COM 537. RADIO AND TELEVISION IN EDUCATION. Sem. 1. SS. Class 3, cr. 3. Admission by consent of instructor.

Survey of the educational and instructional applications of radio and television materials; analysis of selected problems in the educational uses of the media; analysis and application of production practices as related to the learning process.

COM 540. ADVANCED ORAL INTERPRETATION. Class 3, cr. 3. Prerequisite: COM 240 or equivalent.

Study and practice of the techniques of oral interpretation for public performances. Emphasis on analysis of materials, program building, and criticism. Consideration also given to utilizing oral reading techniques in the teaching of literature and speech at the secondary level.

COM 541. ENSEMBLE INTERPRETATION. Class 3, cr. 3. Prerequisite: COM 240 or equivalent.

A study of the history, theories, and styles of group oral presentation of literature including fictional, dramatic, non-fictional, and thematic subjects. Emphasis is placed on experimentation in the styles of presentation and on the development of analytical insights into the various literary forms.

COM 542. ORAL INTERPRETATION OF ELIZABETHAN LITERATURE. Class 3, cr. 3. Prerequisite: COM 240 or equivalent.

A study of the language, styles, and forms of Elizabethan literature for oral presentation. Analysis of the essay, lyric, drama, and other Elizabethan forms (through the study of such authors as Bacon, Spenser, Donne, Jonson, Marlowe, and, especially, Shakespeare) and experimentation with the methods of their successful oral interpretation.

COM 545. THEORIES OF ORAL INTERPRETATION. Class 3, cr. 3. Prerequisite: a course in oral interpretation, or consent of instructor.

A study of the theories of oral interpretation of literature that have emerged from the classical period of Greece and Rome to the present. Emphasis on the influence of leaders in the field during the eighteenth, nineteenth, and twentieth centuries.

COM 582. DESCRIPTIVE/EXPERIMENTAL RESEARCH IN COMMUNICATION. Class 3, cr. 3. Admission by consent of instructor. (May be repeated for credit.)

Introduction to modes of quantitative research in communication, including problem formulation, basic measurement concepts, elementary methods of data collection and analysis, and basic designs for descriptive and experimental research, individual and/or group research projects are planned, conducted, and reported.

COM 584. HISTORICAL/CRITICAL RESEARCH IN COMMUNICATION. Class 3, cr. 3. Admission by consent of instructor. (May be repeated for credit.)

Introduction to modes of qualitative research in communication, including theoretical assumptions, bibliographical methods, varying approaches to historical and critical inquiry, and the standards and techniques of scholarly writing.

COM 590. DIRECTED STUDY OF SPECIAL PROBLEMS. Cr. 1-3. Admission by consent of instructor only. May be repeated for credit.

COM 632. SEMINAR: SPECIAL TOPICS IN MASS COMMUNICATION. Class 3, cr. 3. Admission by consent of instructor. (May be repeated for credit.)

Intensive study of selected topics, varying from semester to semester, from the literature of mass communication. Topics may include institutional analysis, mass communication law, information diffusion, uses of mass communication, or other issues.

CREATIVE ARTS

Art and Design

UNDERGRADUATE LEVEL

A&D 105. DESIGN I. Class 1, Studio 5, cr. 3. Two-dimensional design; an introduction to the elements of design with experiments in the creation of forms and shapes and their organization in a two-dimensional field.

A&D 106. DESIGN II. Class 1, Studio 5, cr. 3. Three-dimensional design; an introduction to the organizatin of forms and volumes in space with experiments in the use of various materials and simple tools.

A&D 113. BASIC DRAWING. Class 1, Studio 5, cr. 3.

An introduction to drawing and sketching as a means of communication of ideas.

A&D 114. DRAWING II. Class 1, Studio 5, cr. 3. Prerequisite: A&D 113 or consent of instructor.

Continuation of A&D 113; emphasis is given to the exploration of a variety of media and the structuring of pictorial space.

A&D 200. DRAWING AND PAINTING I. Class 1, Studio 5, cr. 3.

Course designed to stimulate a beginning understanding of the philosophies, the use of materials, and the practices leading to the art of painting.

A&D 201. ART FOR ELEMENTARY SCHOOL TEACHERS. Class 2, Studio 4, cr. 4.

Art theory and experiences and curriculum theory and materials preparatory to instruction of elementary school children.

A&D 202. INTRODUCTION TO ART EDUCATION. Sem. 1 and 2. Class 3, cr. 3.

Lectures, readings, and discussions covering the history, theory, and professional literature of art education. (Required prior to professional semester.)

A&D 207. PHOTOGRAPHY I. Class 1, Studio 5, cr. 3. Prerequisites: A&D 106 and 114, or consent of instructor.

Introduction to the basic visual and technical qualities of photography.

A&D 213. LIFE DRAWING I. Class 1, Studio 5, cr. 3. Prerequisites: A&D 113 and 114 or consent of instructor.

Introduction to drawing the human figure with emphasis upon structure and gesture.

A&D 214. LIFE DRAWING II. Class 1, Studio 5, cr. 3. Prerequisites: A&D 113 and 114 or consent of instructor.

Continuation of A&D 213; emphasis is given to organizing the figure in pictorial space.

A&D 225. FABRIC PRINTMAKING I. Class 1, Studio 5, Credit 3.

Basic techniques of fabric decoration including Batik, tie and die, and Serigraphy (silk screen).

A&D 242. CERAMICS I. Class 1, Studio 5, cr. 3. (Formerly A&D 369.) Prerequisites: A&D 106 and 114, or consent of instructor.

Beginning problems in ceramics.

A&D 259. PAINTING II. Class 1, Studio 5, cr. 3. Prerequisite: A&D 200 or consent of instructor.

A continuation of A&D 200.

A&D 264. CRAFTS. Class 1, Studio 5, cr. 3. Prerequisites: A&D 106 and 114, or consent of instructor.

Exploration in the creative use of clay and metal media — pottery, jewelry, metal enameling.

A&D 265. RELIEF PRINTMAKING. Class 1, Studio 5, cr. 3. Prerequisites: A&D 105 and 113, or consent of instructor.

An introduction to the techniques and creative use of woodcut, linecut, wood engraving, and serigraphy.

A&D 301. ART IN SECONDARY SCHOOL. Class 2, Studio 2, cr. 3. Prerequisite: sophomore standing or consent of instructor. (Required prior to professional semester.)

Art theory and experiences and curriculum theory preparatory to the instruction of secondary school students.

A&D 355. ART APPRECIATION. Class 3, cr. 3. Not open to freshmen.

Understanding and appreciation of the problems overcome by mankind in the origins and growth of art.

A&D 361. JEWELRY DESIGN. Class 1, Studio 5, cr. 3. Prerequisite: A&D 106, 114 or consent of instructor.

Problems of creation of original designs in jewelry.

A&D 365. PAINTING III. Class 1, Studio 5, cr. 3. Prerequisite: A&D 259 or consent of instructor.

A studio course concentrating on the introduction of attitudes designed to help the individual student to a greater consciousness of his personal creative needs and to help him develop personal means of expression within the art of painting.

A&D 375. SCULPTURE. Class 1, Studio 5, cr. 3. Prerequisite: A&D 106, 114 or consent of instructor.

An introduction to basic techniques of modeling and carving in relief and in the round.

A&D 399. ART TOUR. Lab 4, cr. 2. Prerequisite: consent of instructor. (May be taken concurrently with MUS 399 and/or THTR 399. May be repeated for credit if sites visited are different.)

A course designed to expose students to art works and historical sites of interest to art outside the immediate area. The art world will be observed in relation to the worlds of music and theater.

DUAL LEVEL

Undergraduate-graduate

A&D 590. SPECIAL ART PROBLEMS. Cr. 1-6. Prerequisite: ten hours of art and design. Permission by the head of the department is required.

Individual problems in art history, appreciation, design, crafts, drawing, and painting. Credit dependent upon amount of work done.

GRADUATE LEVEL

A&D 601. SEMINAR IN ART EDUCATION. Class 3, cr. 3.

Critical analysis of professional literature and research in art education.

MUSIC

UNDERGRADUATE LEVEL

MUS 200. VOICE CLASS. Class 1, Lab. 3, cr. 2. (May be repeated one time with permission of the instructor.)

A course of study in singing technique through examination of proper breathing, accurate tone placement, correct vowel formation, and precise diction. Study material will be varied and represent standard vocal literature.

MUS 250. MUSIC APPRECIATION. Class 3, cr. 3.

An introduction to the understanding of music. How to listen to its materials. A study of the media, forms, styles, and composers through recorded, live, and film media. Methods used in the structure of music as well as the aesthetic values present in music are also emphasized.

MUS 301. CHOIR. Lab. 2, cr. 1. (May be repeated three times for a maximum of 4 credits.)

Study, rehearsal, and performance of choral music.

MUS 355. AMERICAN MUSICAL THEATRE. Class 3, cr. 3. (Identical to THTR 355.)

A study of the origins, history, artistry, and unique qualities of American Musical Theatre.

MUS 399. MUSIC TOUR. Lab 4, cr. 2. Prerequisite: consent of instructor. (May be taken concurrently with A&D 399 and/or THTR 399. May be repeated for credit if sites visited are different.

A course designed to expose students to musical works and historical sites of musical interest outside the immediate area. The musical world will be observed in relation to the worlds of art and theater.

MUS 490. GUIDED READING IN MUSIC. Cr. 1-6.

The course is offered for students with specialized needs and interests in the field.

THEATRE

UNDERGRADUATE LEVEL

THTR 136. REHEARSAL AND PERFORMANCE I. Cr. 1 or 2. (May be repeated once for credit.) Maximum number of credits for any combination of THTR 136, 168, 336, and 368 is 4. Prerequisite: consent of instructor.

Study of practice of rehearsal techniques and of stage performance. Students will be assigned to acting and stage management duties in the experimental and major stage productions.

THTR 168. TECHNICAL THEATRE PRODUCTION I. Lab. 3, or 6, cr. 1 or 2. (May be repeated once for credit. Maximum number of credits for any combination of THTR 136, 168, 336, and 368 is 4.) Prerequisite: consent of instructor.

The study and application of technical theatre practice in scene construction, painting, lighting, costuming, and stage management. Students will be assigned to experimental and major stage productions.

THTR 201. THEATRE APPRECIATION. Class 2, Lab. 2, cr. 3.

Understanding and appreciation of the theatre's role in the modern world, including a survey of dramatic structure and analysis, and the functions of the actor, director, designer, and critic related to current stage productions. Laboratory work includes attendance and discussion of the dramatic presentations on campus.

THTR 230. ACTING I. Class 1, Lab. 3, cr. 2. (Should not be taken concurrently with THTR 340.)

Training and exercise in the basic elements of acting and the use of the stage. Study of historical and theoretical backgrounds of acting and of different types of plays and staging.

THTR 255. STAGECRAFT FOR SECONDARY SCHOOLS. Class 1, Lab. 6, cr. 3. Students will be required to accept one University Theatre production responsibility; two of the six laboratory hours will be reserved for this work.

Study of the organizational structure of technical aspects of theatre. Training in planning, executing, painting, and lighting scenery for the stage. Study of the forms of scenery and common physical attributes of the stage.

The study of the above area is supplemented by extensive practical work in each field.

THTR 330. ACTING II. Class 1, Lab. 3, cr. 2. Prerequisite: THTR 110, 120, 130, and/or consent of instructor. (Should not be taken concurrently with THTR 255 or 340.)

Continued training and exercise in the basic elements of acting, including prose dialogue and sight reading; beginning work in role and script analysis; rehearsal in simple scenes. Advanced exercises in believability, observation and awareness, concentration, imagination, and the sense-memory-recall leading to characterization.

THTR 336. REHEARSAL AND PERFORMANCE II. Cr. 1 or 2. (May be repeated once for credit. Maximum number of credits for any combination of THTR 136, 168, 336, and 368 is 4.) Prerequisite: consent of instructor.

The study and practice of rehearsal techniques and stage performance. Students will be assigned to acting and stage management duties in experimental and major stage productions.

THTR 340. INTRODUCTION TO PLAY PRODUCTION AND DIRECTION. Class 2, Lab. 2, cr. 3. Prerequisite: THTR 255. (Should not be taken concurrently with THTR 230 or THTR 330.)

A basic study of directing and administration of play production in the high school: audience analysis, play selection, play lists, play analysis, casting, directing procedures, rehearsal and performance techniques, promotion and publicity, interdepartmental cooperation, and the school dramatic organization. Laboratory application of direction practice.

THTR 355. AMERICAN MUSICAL THEATRE. Class 3, cr. 3. (Identical to MUS 355.)

A study of the origins, history, artistry, and unique qualities of American Musical Theatre.

THTR 360. SCENIC DESIGN. Class 1, Lab. 4, cr. 3. Prerequisite: THTR 225 or 340 or consent of instructor.

A basic study of the theories and practices in the application of three-dimensional design to the stage.

THTR 368. TECHNICAL THEATRE PRODUCTION II. Cr. 1 or 2. (May be repeated once for credit. Maximum number of credits for any combination of THTR 136, 168, 336, and 368 is 4.) Prerequisite: consent of instructor.

The study and application of technical theatre practice in scene construction, painting, lighting, costuming, and stage management. Students will be assigned to experimental and major stage productions.

THTR 399. THEATER TOUR. Lab. 4, cr. 2. Prerequisite: consent of instructor. (May be taken concurrently with A&D 399 and/or MUS 399. May be repeated for credit if sites visited are different.)

A course designed to expose to students the theatrical works and historical sites of theatrical interest outside the immediate area. The theatrical world will be observed in relation to the worlds of art and music.

DUAL LEVEL
Undergraduate-Graduate

THTR 530. ADVANCED ACTING. Class 2, Lab. 8, cr. 5. Prerequisite: THTR 130, 230, and/or consent of instructor.

Advanced work in role and script analysis and character development, including study and practice in difficult prose and verse dialogue reading; intensive study of internal and external aspects of characterization, interaction, and ensemble playing; rehearsal in complex scenes; and participation in one play.

THTR 534. CHILDREN'S CREATIVE DRAMATICS. Class 2, Lab. 2, cr. 3.

Principles of creativity as used in improvision and dramatization. Methods of relating these to children's experiences and children's literature. Direct application of the learning through supervised activity with elementary or junior high students.

THTR 590. DIRECTED STUDY OF SPECIAL THEATRE PROBLEMS. Cr. 1-3. Admission by consent of instructor. (May be repeated for credit.)

An individualized and intensive study of any aspect of theatre required by the student's plan of study.

DEPARTMENT OF EDUCATION

R. H. Rivers, Head

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The Department of Education provides preparatory and developmental programs for various educators such as elementary and secondary school teachers, school administrators, librarians, educational media specialists, and counselors. All programs are fully accredited by The National Council for the Accreditation of Teacher Education (NCATE). Each program includes an integrated sequence of theory and practice, with most undergraduate teacher education courses including laboratory experiences. Field experience in multi-cultural settings are required. Emphasis is placed on developing professional competencies as well as skills in interpersonal relationships.

The undergraduate programs enable students to fulfill the requirements in accordance with state regulations for elementary school, middle school, secondary school or all-grade standard teaching certificates.

The Teacher Education Programs include a general education component, a major in elementary education or a subject matter field and an elective component which may be used to add teaching endorsements. The professional education courses have a spiraling design beginning with exploratory activities in the freshman year and culminating with a nine-week full-time supervised teaching experience.

The Bachelor of Physical Education degree is offered through this department. The course of study is designed to provide the student with a background in many areas of individual and team activities, science, health and safety, and driver education. Included in this program are preparatory courses for coaching of athletic teams. The program may lead to teacher certification if this is the goal of the student.

Graduate programs leading to the Master of Science degree in Education are offered in a number of areas (see page 37). These programs are designed to meet state requirements for professionalization of a teaching certificate as well as to broaden and strengthen the student's background in academic areas. Master's degree programs are individually planned in keeping with the student's certification requirements and professional interests. Certification programs at the graduate level are available in administration, counseling, reading, learning disabilities, and media sciences.

The Office of Teacher Education Services is designed to serve undergraduates and graduates during and after their attendance at Purdue Calumet. This office supervises admission of undergraduates to Teacher Education and arranges field experiences, including student teaching. It also recommends students for certification and advises graduates of employment opportunities through its placement services.

Elementary Education Major (Grades 1-6)

The Elementary Education major can be combined with a teaching endorsement, a program for junior high/middle school certification or directed electives.

A. The following 35 semester hours in Education: ED 101, 200, 201, 220, 221, 300, 301, 326, 327, 329, 330, 400, 424A, 431, 491.
B. Requirements of the School of Humanities, Education and Social Sciences: 54-57 semester hours in general education to meet state certification requirements. (See advisor.)
C. University requirements: sufficient elective courses to bring the total credits to 129.

Additions to the elementary license are available in: Bilingual and Bicultural Proficiency, Kindergarten, Library Services, Physical Education, Reading, School Media Services, Visual Arts.

The elementary major may also become certified in the junior high/middle school by completing an additional program:

A. ED 593, 486, 423, 522, PSY 362.
B. Required course work in language arts, social studies, mathematics or science. (See advisor.)

All-grade Education (Grades K-12)

The All-grade Education major permits the student to teach the specific subject in grades K-12. All-grade majors are available in Physical Education and School Media Services. The professional education courses in the All-grade major are ED 101, 202, 203, 220, 221, 302, 303, 326 or 336, 424I, 491, and 592. Physical Education majors will also take ED 345.

Physical Education All-grade Major (52 semester hrs.)

A. HPER 103, 104, 105, 153, 204, 205, 206, 217, 280, 301, 302, 307, 308, 309, 310, 319, 404, 406, 474, 306, or 316, and five semester hours from 219, 314, 371.
B. Biol 203 and 204.
C. General Education requirements for the degree and certification.

School Media Services All-grade Major (39 semester hrs.)

A. ED 380, 570, 571, 578, 579, 581, 582, 583, 584.
B. Complete 12 semester hours in one of the following options:
   1. Radio and Television Option (12 hrs.) COM 130, 250, 254, 331, 332, 333, 537.
   2. English Option (12 hrs.) ENGL 376 or 386 or 387. Nine semester hours from ENGL 240, 241, 260, 261, 350, 351, 372, 377, 456, and 457.
C. General education requirements for the degree and certification.

Secondary Education (Grades 9-12)

Most secondary teaching programs are offered through the academic departments. See the appropriate department for information on the specific major or minor.

The Education Department provides the professional education courses required for secondary education majors. Secondary education majors should contact the Teacher Education Services Office during the second semester of the freshman year concerning the teacher education program. The professional education courses are ED 101, 202, 203, 220, 221, 302, 303, 336, 424B, 491, and a teaching methods course in the major.

Secondary Education majors may also become certified in the junior high/middle school by completing an additional program:

A. ED 593, 486, 581, 430D, PSY 361.
B. Complete all requirements for a secondary teaching license.

Physical Education Major (37-38 semester hrs.)

A. HPER 103, 104, 105, 153, 158, 205, 206, 280, 302, 307, 309, 316, 319, 406, 474, 204 or 310, and 306 or 316.
B. Biol 203, 204.
C. General education requirements for the degree.
D. The person desiring teacher certification in secondary schools will also complete the professional education requirements for secondary education majors.

Physical Education Minor (24 semester hrs.)

A. HPER 105, 280, 302, 319, 404 and 474.
B. Select five semester hours from HPER 103, 104, 158, 204, 205, 206, 306 or 316, 307 and 309.
C. BIOL 203, 204.

Health and Safety Major (37 semester hrs.)

A. BIOL 203, 204, 211, and 220.
B. AGRY 430.
C. F&N 303.
D. HPER 219, 250, 380, 319, 360.
E. HPER 461 or BIOL 212
F. PSY 428.
G. Complete the general education requirements for the degree.
H. The person desiring teacher certification in secondary school will also complete the professional education requirements for secondary education majors.

Health and Safety Minor (28 semester hrs.)

A. BIOL 203, 204 and 220.
B. HPER 219, 250, 280, 319, and 360.
C. PSY 428.

Audio Visual Services Minor (24 semester hrs.)

A. ED 380 or 581, 570, 571, 579, 583, 584.
B. Six semester hours from ED 575, COM 130, 331, 332, 333, and 537.

Library Services Minor (24 semester hrs.)

A. ED 380 or 581, 570, 578, 582, 583, and 584.
B. Six semester hours from ED 571, 575 and 579.

Reading Minor (24 semester hrs.)

A. ED 327, 328, 336, 422, and 522.
B. Twelve semester hours selected from: ED 231, 523, 570, 581; ENGL 185, 285, 286, 326, 510; AUS 210; and PSY 311.

EDUCATION

UNDERGRADUATE LEVEL

ED 101. INTRODUCTION TO THE FOUNDATIONS OF EDUCATION. Class 0, Lab. 3, cr. 1.

Acquaints students with the broad foundations of education and the roles of various professional educators. Characteristics of the professional educator and desired competencies and skills of the teacher are explored to assist students in making decisions regarding their own interest in and capabilities to enter the profession. Directed observation, self-study materials and seminar sessions are employed. (Classes are composed of Elementary, Secondary and All-Grade education students. Emphasis is on the total educational system.)

ED 200. TEACHING AND LEARNING SEMINAR: ELEMENTARY I. Class 1, cr. 0.

A seminar under the leadership of an instructor who also serves as the professional advisor. Students discuss and explore those ideas, techniques and concepts related to teacher preparation. Identification and clarification of students' personal and professional needs with emphasis on the integration of the learning experiences into a meaningful total program. Elementary majors must enroll in each of the six semesters beginning with the sophomore level. Credit is assigned only in ED 201, ED 301, and ED 431.

ED 201. TEACHING AND LEARNING SEMINAR: ELEMENTARY II. Class 1, cr. 1.

Continuation of the seminar sequence. See ED 200.

ED 202. TEACHING AND LEARNING SEMINAR: SECONDARY I. Class 1, cr. 0.

A seminar under the leadership of an instructor who also serves as the students' professional education advisor. Students discuss and explore those ideas, techniques, and concepts related to teacher preparation. Identification and clarification of students' personal and professional needs with emphasis on the integration of the learning experiences into a meaningful total program. Secondary majors must enroll in a seminar in each of four semesters typically in the sophomore and junior years. Credit is assigned only for ED 203 and ED 303.

ED 203. TEACHING AND LEARNING SEMINAR: SECONDARY II. Class 1, cr. 1.

Continuation of the seminar sequence. See ED 202.

ED 212. INTRODUCTION TO EARLY EDUCATION. Class 3, cr. 3.

Reviews history and philosophy of kindergartens and other programs for young children. Classroom organization and management alternatives are analyzed. Emphasis is placed on meeting individual needs of young children through group and individual activities.

ED 214. TUTORIAL ASSISTANCE TRAINING. Class 2, Lab. 2, cr. 3.

Designed to provide the skills and procedures necessary for an effective teaching-learning experience on a one-to-one basis. Focus will be upon the types of cognitive and affective skill development needed by the professional or paraprofessional in a tutor-teaching role. Competency in the content area(s) assumed.

ED 220. PSYCHOLOGY OF LEARNING. Class 2 Lab. 2, cr. 3. Not open to student with credit in ED 285.

An examination of the learner and learning. Study of the cognitive, social, physical, moral and personality development from early childhood through adolescence; implications of developmental stages for educational planning and intervention. Principles of basic learning theories, facilitative conditions and strategies for enhancing learning; classroom management

as a means to foster the learner's development and learning. Survey of techniques for assessing the learner, learning and identification of learning dysfunctions. Supervised laboratory and field experiences in area schools for observation, involvement and practice with learners and learning.

ED 221. SOCIETY, SCHOOL AND THE PROFESSIONAL EDUCATOR. Class 3, cr. 3. Not open to students with credit in ED 480 or 485.

Examination of philosophical ideas and social forces which have shaped and continue to shape public education. Consideration of past, present and future relationships between school and society. The role of the professional educator in shaping these relationships. Introduction to basic legal responsibilities and ethical guidelines which determine professional conduct. Consideration of contemporary educational issues. Selected schools representing diverse educational philosophies, cultural settings and levels will be visited and studied.

ED 231. INTRODUCTION TO SPECIAL EDUCATION. Class 3, cr. 3.

A survey of the field of special education; consideration of the kinds of children served, why they need special help, and how it can be provided.

ED 241. GENERAL STRATEGIES FOR INSTRUCTION. Class 3, Lab 2, Cr. 4. Prerequisite: ED 220.

Acquaints students with general methods and materials for teaching at various levels. Fundamental principles of classroom management and planning of instructional units. Field experiences are integrated with classroom instruction. (Not a substitute for methods courses in 4-year teacher education program.)

ED 300. TEACHING AND LEARNING SEMINAR: ELEMENTARY III. Class 1, cr. 0.

Continuation of the seminar sequence. See ED 200.

ED 301. TEACHING AND LEARNING SEMINAR: ELEMENTARY IV. Class 1, cr. 1.

Continuation of the seminar sequence. See ED 200.

ED 302. TEACHING AND LEARNING SEMINAR: SECONDARY III. Class 1, cr. 0.

Continuation of the seminar sequence. See ED 202.

ED 303. TEACHING AND LEARNING SEMINAR: SECONDARY IV. Class 1, cr. 1.

Continuation of the seminar sequence. See ED 202.

ED 312. THE EARLY EDUCATION PROGRAM: COGNITIVE AREAS. Class 2, Lab. 2, cr. 3. Prerequisite: ED 212.

Presentation of various techniques for beginning academic learning through language arts, social studies, math, science, and the arts for preschool and kindergarten.

ED 313. THE EARLY EDUCATION PROGRAM: SOCIAL AND EMOTIONAL AREAS. Class 2, Lab. 2, cr. 3. Prerequisite: ED 212.

Reviews the building of socialization skills. Emphasis is on dealing with feelings, expressing emotions, developing attitudes and self-concept. Explores parent-teacher cooperation.

ED 324. MUSIC FOR ELEMENTARY SCHOOL TEACHERS.* Class 3, Cr. 3.

Basic musical experience, including elementary music skills. Principles and procedures of teaching music. Relationship of music to other subject areas. Music materials.

ED 326. TEACHING READING IN THE ELEMENTARY SCHOOL.* Class 3, Cr. 3.

Methods and materials for teaching reading in the elementary school. Suggests a diagnostic-prescriptive approach from reading readiness through the development of word attack and comprehension skills and includes strategies for incorporating literature and reading of content subjects. Provision for individual and cultural differences stressed. Appropriate field experiences are provided.

ED 327. CORRECTIVE READING FOR THE CLASSROOM TEACHER.* Class 2, Lab. 3, cr. 3. Prerequisite: ED 326 or ED 336.

Classroom procedures for the identification of reading difficulties; selection and application of appropriate methods and materials to provide corrective treatment. Emphasizes approaches to discovering and diagnosing reading; techniques for selecting materials in planning a remedial program, methods for teaching specific skills and techniques for evaluating progress. Appropriate laboratory and field experiences are provided.

ED 328. PRACTICUM IN READING FOR THE CLASSROOM TEACHER.* Class 1, Lab. 4, cr. 3. Prerequisite: ED 327.

The course is designed for prospective teachers in elementary or secondary schools who desire advanced supervised practice in teaching reading to pupils experiencing reading difficulty. It is required for a minor in reading. The practicum will provide extended diagnostic and teaching experiences in a wide range of reading settings. The seminar will evaluate diagnostic and tutoring strategies, methods, materials, and achievement.

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ED 329. TEACHING LANGUAGE ARTS AND SOCIAL STUDIES IN THE ELEMENTARY SCHOOL.* Class 3, Lab. 3, cr. 4. Not open to students with credit in ED 320 and 322.

Curriculum principles and objectives, organization and utilization of methods, materials and media and evaluation procedures in language arts and social studies instruction. Included are fundamental principles of classroom management and individualization of instruction to meet intellectual, ethnic and cultural development and needs of elementary students. Field experiences are integrated with classroom activities.

ED 330. TEACHING MATHEMATICS AND SCIENCE IN THE ELEMENTARY SCHOOL.* Class 2, Lab. 6, cr. 4. Not open to students with credit in ED 321 and 323.

Materials and methods in teaching science and mathematics at elementary levels. Field experiences are integrated with classroom activities.

ED 336. READING IN MIDDLE AND SECONDARY SCHOOLS: METHODS AND PROBLEMS.* Class 3, cr. 3.

A course for prospective secondary teachers. Emphasis placed on techniques and strategies of teaching reading in secondary classrooms and incorporation of reading skills in the various content areas. Attention is given to teaching reading skills and providing for students of varying reading abilities. Provision for simulated activities, field experiences and observations.

ED 337. THEORY AND HISTORY OF BILINGUAL/BICULTURAL EDUCATION. Class 3, cr. 3.

This course will provide the student with an overview of bilingualism and will introduce him/her to the bilingual setting in the schools with bilingual programs.

ED 340. METHODS AND MATERIALS IN TEACHING VISUAL ARTS AND CRAFTS AT MULTI-LEVELS OF INSTRUCTION.* Class 2, Lab. 2, cr. 3.

Evaluation, selection and utilization of art materials and techniques used in the instructional program. Field experiences will provide a supportive, practical base.

ED 341. ENGLISH TEACHING IN SECONDARY SCHOOLS.* Class 2, Lab. 3, cr. 3. Not open to students with credit in ED 405.

Acquaints students with methods and materials for teaching English in secondary schools. Includes an overview of the role of the English teacher today, a brief survey of the development of English as a school discipline, and planning of instructional units. Field experiences are integrated with classroom instruction.

ED 342. STRATEGIES OF FOREIGN LANGUAGE INSTRUCTION IN SECONDARY SCHOOLS.* Class 2, Lab. 2, cr. 3. Not open to students with credit in ED 410.

Acquaints students with methods and materials for teaching foreign language both as a language experience and as a cultural experience. Comparative studies of various language teaching methods and an analysis of current foreign language textbooks are included. The use of audio-visual materials and equipment are stressed, including the appropriate use of the language laboratory. Field experiences are integrated with classroom instruction.

ED 343. STRATEGIES OF TEACHING HEALTH AND SAFETY IN SECONDARY SCHOOLS.* Class 2, Lab. 2, cr. 3. Not open to students with credit in ED 419.

Focuses on specific teaching methods, materials, strategies for classroom management, and subject matter content appropriate for health and safety instruction in secondary schools. Field experiences in area schools are an integral part of the laboratory phase of the course.

ED 344. STRATEGIES OF MATHEMATICS INSTRUCTION IN SECONDARY SCHOOLS.* Class 2, Lab. 2, cr. 3. Not open to students with credit in ED 408.

Materials and methods in teaching mathematics in the secondary school. Field experiences are integrated with classroom instruction.

ED 345. STRATEGIES OF TEACHING PHYSICAL EDUCATION IN SECONDARY SCHOOLS.* Class 2, Lab. 2, cr. 3. Not open to students with credit in ED 414.

Prepares students for their student teaching experience. The course covers various methods of teaching physical education, the organization of the class for instruction, use of facilities, and control of equipment. Unit and daily lesson plans will be prepared and implemented in laboratory experiences. Field experiences are integrated with classroom instruction.

ED 346. STRATEGIES OF SCIENCE INSTRUCTION IN SECONDARY SCHOOLS.* Class 2, Lab. 3, cr. 3. Not open to students with credit in ED 402, 404, or 412.

Materials and methods in teaching science in the secondary school (includes Biology, Chemistry, Physics and General Science). Field and laboratory experiences are integrated with classroom instruction.

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ED 347. STRATEGIES OF SOCIAL STUDIES INSTRUCTION IN SECONDARY SCHOOLS.* Class 2, Lab. 2, cr. 3. Not open to students with credit in ED 406.

Acquaints students with materials and literature relating to the social studies field generally and the primary teaching area particularly. Methods of applying the principles of teaching in a social studies setting are emphasized through classroom simulations and field experiences.

ED 348. STRATEGIES OF SPEECH AND THEATER INSTRUCTION IN SECONDARY SCHOOLS.* Class 2, Lab. 3, cr. 3. Not open to students with credit in ED 418.

Focuses on specific teaching methods, materials, subject matter content, and resources appropriate for speech and theater instruction at the secondary level. The student will develop a file of observations and participatory experiences and will be required to analyze and synthesize the practical aspects of teaching with theoretical information. A field experience component will be required.

ED 378. INTRODUCTION TO LIBRARIES AND MEDIA CENTERS. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3.

A survey of the functions of libraries as an auxiliary resource for learning in the elementary school and secondary school, including opportunities for examining materials and operating equipment. Directed observation in various types of libraries and media centers is provided.

ED 380. MEDIA FOR CHILDREN. Class 3, cr. 3.

Books, films, filmstrips, records, magazines and other resources provided in elementary media centers are studied and evaluated to meet the personal and educational needs of pupils in elementary schools. Emphasis is on wide reading of children's books and viewing of many media and their utilization with children.

ED 400. TEACHING AND LEARNING SEMINAR: ELEMENTARY V. Class 1, cr. 0.

Continuation of the seminar sequence. See ED 200.

ED 424A. SUPERVISED TEACHING IN THE ELEMENTARY SCHOOL.* Cr. 8.

Nine weeks of full-time student teaching in elementary school classrooms under the supervision of the elementary education staff and public school teachers. Emphasis on preparation and presentation of major teaching units and full classroom responsibility.

ED 424B. SUPERVISED TEACHING OF SECONDARY SCHOOL SUBJECTS.* Cr. 8.

Nine weeks of full-time student teaching in some academic subject or physical education in secondary schools under the supervision of the public school teachers in charge of the high school classes and supervisors from the University.

ED 424G. SUPERVISED TEACHING IN INDUSTRIAL EDUCATION SUBJECTS.* Cr. 8.

Nine weeks of full-time student teaching in industrial arts, trade and industrial, or technical subjects classes in secondary schools, vocational schools, junior colleges, or technical institutes under the supervision of the industrial education staff and the instructors in charge of the classes.

ED 424I. SUPERVISED TEACHING: ALL GRADE EDUCATION.* Cr. 8.

Nine weeks of full-time student teaching in either media sciences or physical education in an elementary or secondary school under the supervision of a public school teacher and an appropriate university staff person.

ED 430B. SUPERVISED TEACHING OR PRACTICUM: KINDERGARTEN.* Cr. 3.

Observing and teaching in Kindergarten classes under the supervision of University staff and public school teachers.

ED 430D. SUPERVISED TEACHING OR PRACTICUM: JUNIOR HIGH/MIDDLE SCHOOL.* Cr. 3.

Observation and teaching of a subject in a junior high-middle school under the supervision of a public school teacher and a University supervisor.

ED 431. TEACHING AND LEARNING SEMINAR: ELEMENTARY VI. Class 1, cr. 1.

Continuation of the seminar sequence. See ED 200.

ED 437. METHODS FOR TEACHING IN A BILINGUAL/BICULTURAL SETTING.* Class 2, Lab. 2, cr. 3.

This course stresses the skills the student-teacher will need in dealing with a bilingual child. One half of the course will be devoted to a teaching laboratory. This teaching experience will take place in school systems with a bilingual program.

ED 486. GUIDANCE IN THE CLASSROOM: ELEMENTARY AND MIDDLE SCHOOL. Class 3, cr. 3.

Designed to acquaint students with guidance activities appropriate for use by the classroom teacher, this course focuses on areas such as study of pupil behavior, individual appraisal, career development, consultation, and group processes. Opportunity for students to pursue activities at multilevels is provided.

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ED 490. INDIVIDUAL RESEARCH AND TEACHING EXPERIENCE. Cr. 1-4. Prerequisite: consent of department.

Opportunity for undergraduate students to investigate particular problems in the field of education under supervision.

ED 491. TOPICS AND ISSUES IN EDUCATION. Class 1, cr. 1.

Provides the student with the opportunity to strengthen the preparation program through the study of selected educational topics and issues based on individual needs and interests. Such areas as Legal Rights and Responsibilities of Teachers, Cultural Pluralism, Classroom Management and Discipline, Schools in the Urban Setting, and Exceptional Learners will be investigated. One topic is dealt with in each enrollment.

DUAL LEVEL

Undergraduate-Graduate

ED 500. HISTORY AND PHILOSOPHY OF EDUCATION. Class 3, cr. 3. (Can be repeated for credit.)

Consideration of the major ideas, trends, and movements in the development of education. This course will be taught under three separate topics as follows: (1) history of western education, (2) history of American education, and (3) philosophy of American education. Students may enroll for more than one section.

ED 503. THE CONSTITUTION AND AMERICAN EDUCATION. Class 3, cr. 3. Must be preceded by 12 hours of education and psychology.

The course is designed to give the student an opportunity to analyze the basic constitutional framework within which law and education must function. Examines role of courts in determining educational policy. Student is led to make a critical examination of the constitutional basis justifying court decisions. Attention is given to the impact of court decisions on educational policy, utilizing a case study method.

ED 508. THE TEACHER AND THE LAW. Class 3, cr. 3.

Basic course for teachers and prospective teachers to examine legal rights and responsibilities of school personnel and students. Areas covered: due process, teacher negligence and liability, contract rights, tenure laws, student discipline, teacher organizations and collective bargaining, and other school-related topics.

ED 509. HUMAN RELATIONS LABORATORY: PERSONAL AWARENESS AND INTERPERSONAL RELATIONSHIPS. Lab 4, cr. 2. Admission by consent of instructor only.

Objectives for this course emphasize (1) personal and interpersonal learning, and (2) increased awareness and understanding of small group processes. Procedures utilize the human relations experiential approach, which necessitates individual involvement in the learning process and shared responsibility for exploring class members' feelings and ideas. Intensive and immediate experiences, both verbal and nonverbal, in the entire class and in small groups, problem solving exercises, skill training activities, unstructured processes, and tasks requiring the total resources of the large group are among the methods used. The emphasis is upon immediate personal experience in a climate that encourages learning, understandings, insights, and skills, in the area of self, group, and organizations.

ED 510. INTRODUCTION TO GUIDANCE. Class 3, cr. 3. Must be preceded by 12 hours of psychology and education or equivalent professional training.

Treats the history, principles, services, and theoretical development of guidance with consideration given to counselor role and functions, current practices, and emerging trends and issues.

ED 511. GUIDANCE IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Must be preceded by 12 hours of education and psychology.

Guidance problems arising in the elementary school, and principles and techniques applicable to their solution. Role of the classroom teacher in providing services to pupils and parents.

ED 512. CAREER THEORY AND INFORMATION. Class 3, cr. 3.

Treats career development theories which emphasize aspects of the self in decision-making, occupational classification systems, and education and vocational information with applications to individual and group counseling.

ED 516. INTRODUCTION TO COUNSELING IN THE COMMUNITY. Class 3, cr. 3. Must be preceded by 12 hours of education and psychology.

Designed to provide an overview of counseling as it relates to community issues and needs. Roles and settings for the community counselor and specific intervention skills will be stressed.

ED 517. PREPRACTICUM IN CAREER COUNSELING. Class 1, Lab. 2, cr. 2. Must be preceded by or taken concurrently with ED 512 and PSY 505 or equivalents.

Practical experience in selecting and using appraisal instruments, occupational classification systems, occupational information systems, simulation and mechanized information systems, in career counseling. Designed to prepare the student for Counseling Practicum.

ED 520. FOUNDATIONS FOR REMEDIAL READING. Class 3, cr. 3. Prerequisites: 12 hours of education and psychology; also recommended prerequisites: ED 522 or ED 676.

First course in sequence leading to certification as a reading specialist, but may be elected by others needing basic information in reading. Considers history, psychology and physiology, and current practices in developmental and remedial reading.

ED 521. DIAGNOSIS AND TREATMENT OF READING DISABILITIES. Class 2, Lab. 3, cr. 3. Prerequisite: ED 520.

Focuses on diagnostic instruments and procedures for identification and remediation of reading disabilities and associated learning, language, or behavioral disorders. Designing specific remedial programs is also emphasized.

ED 522. READING IN MIDDLE AND SECONDARY SCHOOLS. Class 3, cr. 3. Must be preceded by 12 hours of education or psychology.

A course designed for teachers and prospective teachers in subject matter areas of the junior and senior high school. May be taken as part of the sequence leading to Reading Specialist or for the Junior High-Middle School endorsement program. Surveys of techniques and objectives of reading instruction in the schools with special attention to the opportunities and obligations to teach reading within content areas. Teaching experience helpful but not required.

ED 523. INTRODUCTION TO MEASUREMENT AND EVALUATION. Class 2, Lab. 2, cr. 3. ED 220 or equivalent.

An introduction to the basic concepts and principles of measurement and evaluation with special emphasis on descriptive statistics, and teacher made and standardized tests.

ED 524. MEASURING EDUCATIONAL ACHIEVEMENT. Class 3, cr. 3.

A course in test construction. The primary objective is to help students to develop the facility to write behavioral objectives and test items to measure the objectives. The course is designed to help the student learn to write test items that deal not only with the relevant content but also with the process involved.

ED 525. INTRODUCTION TO EDUCATIONAL RESEARCH I: METHODOLOGY. Class 3, cr. 3. Must be preceded by PSY 120 or consent of instructor.

An introductory course in educational research and evaluation methodology which considers the various methods of educational research, the formulation of research hypotheses, and the preparation of research reports.

ED 529. PERSONAL-SOCIAL DYNAMICS OF CLASSROOM MENTAL HEALTH. Class 3, cr. 3. Must be preceded by PSY 120 and ED 220 or equivalent.

Stresses the understanding of personal and socio-emotional growth and adjustment of students and teachers in the total school environment. Emphasis is placed upon the prevention of mental health problems in educational settings. Special attention is given to learning how to control the situational and environmental conditions necessary to positive personal and socio-emotional growth.

ED 530. ADVANCED EDUCATIONAL PSYCHOLOGY. Class 3, cr. 3. Must be preceded by PSY 120 and ED 220.

Theories of learning and development, research on instruction and learning, and principles of measurement applied to educational problems.

ED 532. EDUCATIONAL ASSESSMENT OF EXCEPTIONAL CHILDREN. Class 2, Lab. 3, cr. 3. Prerequisite: Admission to special education certification program and a course in tests and measurements or consent of instructor.

An introduction to the procedures for educational assessment of exceptional children. Emphasis is given to criterion-referenced, norm-referenced and observational assessment instruments and procedures which are designed primarily for exceptional children. Laboratory experiences in the assessment of exceptional children are required.

ED 533. FOUNDATIONS IN THE EDUCATION OF EXCEPTIONAL CHILDREN. Class 3, cr. 3. Prerequisite: Completion of a teacher certification program or consent of instructor. May be repeated for credit.

Etiologies and characteristics of exceptional children with varying exceptionalities including (A) Developmental Learning, (Q) Learning Disabilities, (D) Emotionally Disturbed. Field trips to various programs are arranged. One topic is dealt with in each enrollment.

ED 534. STRATEGIES IN TEACHING EXCEPTIONAL CHILDREN WITH VARYING DISABILITIES. Class 2-3, cr. 2-3.

Strategies for teaching exceptional children with varying exceptionalities including (A) Task Oriented Instruction, (Q) Learning Disabilities. (D) Emotionally Disturbed, Laboratory experience with exceptional children is required in task oriented instruction. One topic is dealt with in each enrollment.

ED 535. SUPERVISED TEACHING OF EXCEPTIONAL CHILDREN WITH VARYING DISABILITIES. Cr. 4.

Supervised teaching of exceptional children with varying exceptionalities including (Q) Learning Disabilities, (D) Emotionally Disturbed. Laboratory experience is required. One topic is dealt with in each enrollment.

ED 538. TEACHING OF EXCEPTIONAL CHILDREN. Class 3, Lab. 1, cr. 3. Must be preceded by admission to special education certification program or consent of instructor.

Techniques of managing behavior of exceptional children emphasizing the development of interpersonal communication skills such as life span interviewing. Special attention to curriculum modification to facilitate humanistic teaching emotionally disturbed children. Laboratory experiences are required.

ED 539. ISSUES AND TRENDS IN SPECIAL EDUCATION. Class 3, cr. 3. Must be preceded by ED 535 or consent of instructor.

Consideration of various conceptual models of exceptionality and implications for exceptional individuals. Emphasis is devoted to the "labelling" controversy, categorical vs. non-categorical special education. Litigation and the rights of children, alternative educational delivery systems, applications of technology and "normalization."

ED 545. INFORMATION SYSTEMS IN EDUCATION. Class 3, cr. 3.

An overview of automated data processing applications to education. Primary emphasis on administrative applications for pupil, staff, facility, program, and financial accounting.

ED 546. FOUNDATIONS OF EDUCATIONAL ADMINISTRATION. Class 3, cr. 3.

Administration of education; roles of local, state, and federal government. Focus on purpose, organization, task areas, and processes of educational administration.

ED 547. EDUCATIONAL FACILITIES PLANNING. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

Systems approach as a basis for school facilities planning. Study directed toward procedures for solving facilities problems. Emphasis on techniques for developing and securing technical information.

ED 548. ECONOMICS OF EDUCATION. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

A general course in financing education including current economic theories, sources of revenues, and trends in fiscal structure and operations in education.

ED 550. TEACHING PROCEDURES IN VOCATIONAL HOME ECONOMICS EDUCATION. Cr. 3. For graduates in home economics with teaching experience or by consent of the instructor.

Current trends in the teaching of vocational home economics classes. Individual teacher needs served through work on special problems.

ED 556. CURRICULUM DEVELOPMENT IN VOCATIONAL HOME ECONOMICS. Cr. 3. Must be preceded by 12 hours in education or equivalent professional training.

A course in current curriculum trends and problems in vocational homemaking, especially designed for home economics teachers and supervisors that enables them to analyze the unique contributions of a secondary home economics curriculum to the functions of the school; compare secondary home economics curriculum organized along different theoretical lines with emphasis on conceptual structure and levels of generalizations; study the articulation of secondary home economics curricula from one grade level to the next; analyze and/or develop curriculum models uniquely designed for own school situation.

ED 560. SCHOOL-COMMUNITY RELATIONS. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

This course will stress concepts and principles relevant to school-community interaction. It will focus on the new roles of the public in education and will deal with problems encountered by educators in communicating with the public.

ED 570. AUDIO-VISUAL MEDIA FOR EDUCATION. Cr. 1-3. Must be preceded by three hours of educational psychology and junior standing.

Evaluation, selection, and utilization of audio-visual media and techniques used in the instructional program of the modern school with added emphasis on the design and development of multi-media presentation.

ED 571. PREPARATION OF INSTRUCTIONAL MATERIALS. Class 1, Lab. 4, cr. 3.

Design and preparation of a variety of instructional materials for use by instructional materials specialists, teachers, librarians, and A-V coordinators in educational situations. Laboratory practice is provided in production of these materials.

ED 574. INSTRUCTIONAL TELEVISION. Cr. 3. Must be preceded by ED 530 or by consent of the department.

The place of instructional television in the classroom. Emphasis on curriculum implications and research. Opportunity to study and observe the production and utilization of classroom television.

ED 575. COMPUTER-ASSISTED INSTRUCTION. Class 3, cr. 3. Must be preceded by Ed 530 or consent of instructor.

Major trends in computer-assisted instructing and computer-managed instruction are reviewed. Various learning design strategies are applied within an existing instructional language such as PLANIT or TUTOR, or between a computer-managed instruction sys-

tem and a general interactive computer language such as BASIC. Consideration is also given to adjunct computer-based instructional materials, instructional gaming, and lesson conversion from one language to another. The course involves the development, coding, and tryout of instructional material interactively on a general purpose computer.

ED 577. CHILDREN'S LITERATURE. Class 3, cr. 3. Must be preceded by junior standing.

A survey of modern and traditional literature for children including authors and illustrators; guidance in uses of children's literature in relation to developmental interests, needs and skills of children; emphasis is on evaluating materials, reviewing sources and developing discrimination in choosing children's literature. This course is designed for beginning graduate students who plan to be school library/media specialists, but is available for classroom teachers.

ED 578. REFERENCE RESOURCES. Class 3, cr. 3.

A study of reference services in school media centers including the most commonly used reference sources in library and audio-visual materials. Bibliographical form is emphasized.

ED 579. AUDIO-VISUAL SERVICES IN SCHOOL MEDIA PROGRAMS. Class 3, cr. 3. Must be preceded by five hours of education and psychology.

Current trends, functions, and processes of media services in educational situations with emphasis on nonprint media and equipment.

ED 581. YOUNG ADULT MEDIA AND READING. Class 3, cr. 3. Must be preceded by junior standing and three hours of educational psychology.

Evaluation, selection, and utilization of print and nonprint materials in the various subject fields with implications for research, recent trends and current developments in the teaching of reading.

ED 582. CATALOGING AND CLASSIFICATION. Class 3, Lab. 2, cr. 3. Must be preceded by junior standing.

Principles of cataloging and classification of educational media and organization of these resources, with laboratory practice in cataloging books and audio-visual materials and in ordering and using printed cards.

ED 583. ADMINISTRATION OF SCHOOL MEDIA PROGRAMS. Class 3, cr. 3. Must be preceded by ED 570, 571, 578, or consent of instructor.

Principles of administration and management of school media programs with emphasis on organization, program development, staff, budget, and space.

ED 584. MEDIA/INSTRUCTIONAL DEVELOPMENT PRACTICUM. Cr. 2-3. Admission by consent of the instructor.

Supervised field experiences in school media centers and/or in programs involving instructional development activities.

ED 586. INTRODUCTION TO INSTRUCTIONAL DEVELOPMENT AND COMMUNICATION. Class 3, cr. 3. Must be preceded by three hours of educational psychology.

An introduction to the principles of designing instructional materials and to instructional communication theory and techniques. Topics include objectives, student characteristics, media selection, communication variables, message design, and systematic evaluation.

ED 590. INDIVIDUAL RESEARCH PROBLEMS. Cr. 1-6. Must be preceded by six hours of psychology and six hours of education or equivalent professional training.

Opportunities for students to study particular problems under the guidance of a member of the staff. This plan of individualized instruction may be used in any field of education or vocational education. Does not include thesis work.

ED 591. EDUCATIONAL PROBLEMS OF TEACHERS. Cr. 1-4.

Primarily for experienced teachers desiring credit from special workshops or individual study. Topics of individual study will deal with problems arising from the professional work of classroom teachers.

ED 593. CURRICULUM FOR EMERGING ADOLESCENTS. Class 3, cr. 3.

Middle-school curriculum concepts, characteristics of emerging adolescent youth, and implications for designing and implementing curricula concurrent with these characteristics and needs.

ED 594. MULTICULTURAL EDUCATION. Class 3, cr. 3.

Concepts and theories of ethnicity and cultural pluralism: Implications for educational change. Examination of value systems and cultural characteristics of various ethnic groups, different ethnic learning styles, ethnically pluralistic curriculum content and instructional materials, and conceptual curriculum design strategies for implementing multicultural education.

ED 595. SECONDARY SCHOOL CURRICULUM. Cr. 2-3.

Objectives, organization, and administration of the secondary school curriculum.

GRADUATE LEVEL

ED 609. COUNSELING THEORIES AND TECHNIQUES LABORATORY. Lab. 4, cr. 2. Must be taken concurrently with ED 610 or by consent of instructor.

Use of counseling techniques in a supervised laboratory; application of theories and techniques within varying employment settings.

ED 610. COUNSELING THEORIES AND TECHNIQUES. Class 6, cr. 5. Must be preceded by satisfactory completion of six graduate hours of counselor education courses and admission by consent of instructor.

Examination of major counseling theories; selection and use of counseling techniques in a supervised laboratory; application of theory and techniques within varying employment settings.

ED 611. SEMINAR IN THEORIES OF GROUP COUNSELING. Class 3, cr. 3. Must be preceded by ED 509.

A critical review of current concepts and theories with emphasis upon group counseling, leadership, membership methods, research and ethical considerations. Illustrative of major approaches examined are human relations training, basic encounter, transactional analysis, and Gestalt.

ED 612. ORGANIZATION AND ADMINISTRATION OF GUIDANCE. Class 2 or 3, cr. 2 or 3. Must be preceded by ED 510.

Procedures in organizing and administering guidance services; observation of programs operating in selected schools, industries, and service organizations, with particular emphasis on cooperative participation of various personnel.

ED 613. COUNSELING PRACTICUM. Class 1, Lab. 6, cr. 2 or 3. May be repeated for credit. Must be preceded by ED 610 and admission by consent of instructor.

(A) elementary school (B) secondary school (C) college (D) group supervised use of educational, vocational and personal counseling techniques with emphasis upon their use in the settings cited above.

ED 614. SUPERVISED FIELD PRACTICE IN COUNSELING OR COLLEGE PERSONNEL SERVICES. Cr. 1-6. May be repeated for credit. Must be preceded by six hours of counselor education and admission by consent of instructor.

Supervised field practice in schools, colleges or agencies in which there are counseling or student personnel services.

ED 615. ADVANCED COUNSELING PRACTICUM. Class 1, Lab. 6, cr. 3. Must be preceded by ED 613, PSY 423 and 523. Admission by consent of instructor.

Supervised use of educational, vocational and personal counseling techniques with emphasis upon more complex and difficult client situations. May be repeated for credit.

ED 616. CASE STUDY AND INDIVIDUAL ANALYSIS IN COUNSELING AND GUIDANCE. Class 2, Lab. 2, cr. 3. Must be preceded by ED 610, PSY 505, and consent of instructor.

Method and technique of comprehensive study of individuals with emphasis on the function of case study in the counselor's understanding of development, diagnosis, and treatment of special problems.

ED 618. COUNSELING SEMINAR. Class 3, cr. 1-4. May be repeated for credit. Open to graduate students who have successfully completed 12 semester hours of previous counseling and personnel services courses.

Recent investigation and research in (1) counselor supervision, (2) professional issues, (3) counseling theories, (4) education of counselors and student personnel workers, (5) counseling methodology, (6) vocational development, (7) elementary school counseling, (8) counselor consultation, and (9) other relevant topics. One topic is dealt with in each enrollment.

ED 620. MATERIALS DESIGN FOR INSTRUCTIONAL SYSTEMS. Class 1, Lab. 4, cr. 3. Must be preceded by ED 570 and 571.

The design, development, and analysis of instructional materials for small-scale instructional systems. This course will involve the study and formulation of behaviorally stated objectives, content structures, systems analysis, consideration of materials preparation problems, an examination of various arrangements for control of stimulus presentations, and the consideration of various arrangements of mediational devices for evaluation.

ED 621. MEDIA RESOURCES. Class 3, cr. 3. Must be preceded or accompanied by ED 570, 571, 578.

Theory and practice of selection and collection development for school media centers including acquisition, reviewing, and procedures for evaluating media resources. Literature and audiovisual media in the various subject fields with attention to bibliographic and fact sources including leaders, curriculum movements, and contemporary materials.

ED 626. ADVANCED INSTRUCTIONAL DEVELOPMENT AND SYSTEMS TECHNOLOGY. Class 3, cr. 3. Must be preceded by ED 586 or by consent of instructor.

Applications of instructional systems technology to educational situations. In-depth treatment of learner analysis, task analysis, learning activities design, learner verification and summative evaluation. Administration of instructional systems and management of sub-systems are studied.

ED 630. SECONDARY SCHOOL ADMINISTRATION. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

Study of the role and responsibilities of the secondary school principalship; focus on organization and administration of students, staff, and educational program; special consideration devoted to schedule construction, program accounting, and school and community relations.

ED 631. ELEMENTARY SCHOOL ADMINISTRATION. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

Study of role and responsibilities of the elementary school principalship; focus upon leadership functions in staff and pupil personnel, school and class organization, plant management, instructional and educational program, and school and community relations.

ED 632. SEMINAR: THE SCHOOL PRINCIPALSHIP. Cr. 2-4. Must be preceded by ED 630 or 631.

Individual exploration in depth of selected aspects of the school principalship and critical analysis of related issues.

ED 634. BUSINESS MANAGEMENT IN EDUCATION. Class 3, cr. 3. Must be preceded by ED 548 or consent of instructor.

Examination of internal and external determinants of school fiscal policy. Experiences with fiscal procedures for school budgeting and accounting, including preparation of a school budget.

ED 635. LEGAL ASPECTS OF AMERICAN EDUCATION. Cr. 3. Must be preceded by nine hours of education or consent of instructor.

Legal foundations of education as established by constitutional provisions, court decisions, opinions of attorney generals, administrative rulings and executive directives. Emphasis on legal theory and principles currently in state of change. Stress on case study method of investigation into educational law.

ED 636. SUPERVISION OF INSTRUCTION AND INSTRUCTIONAL PERSONNEL. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

Examination of the functions of school administration which focuses on achievement of instructional expectations of educational service. Emphasis on developing an individualized supervisory program for instructional personnel.

ED 637. PERSONNEL ADMINISTRATION. Class 3, cr. 3. Must be preceded by ED 546 or consent of instructor.

Provision of a conceptual framework for dealing with school personnel problems. Emphasis placed on implications of social change for personnel administration, the nature and scope of the personnel function, problems created by conflict between individual needs and organizational demands, and the strategies and consequences of collective negotiations.

ED 639. CLINIC FOR EDUCATIONAL LEADERS. Class 3, cr. 3.

ED 655. EVALUATION IN VOCATIONAL HOME ECONOMICS EDUCATION. Class 3, cr. 3. Must be preceded by 12 hours of education or equivalent professional training.

Evaluation theory and techniques for home economics teachers. Analysis, construction, and refinement of measuring instruments and interpretation of results of evaluation procedures in vocational home economics.

ED 656. SUPERVISION IN VOCATIONAL HOME ECONOMICS EDUCATION. Class 3, cr. 3. For graduates in home economics with teaching experience or by consent of instructor.

Purposes, principles and procedures of effective supervision in vocational home economics. Special emphasis given to preparation of supervising teachers of vocational home economics.

ED 661. PRACTICUM IN REMEDIAL READING. Class 1, Lab. 5, cr. 3. Must be preceded by ED 520 and 521. Admission by consent of instructor. May be repeated for credit at an advanced level.

Supervised clinical practice in reading with children or adults who are severely handicapped in reading.

ED 666. ORGANIZATION AND ADMINISTRATION OF SPECIAL EDUCATION. Class 3, cr. 3. Must be preceded by six hours of educational administration and/or supervision, or by consent of instructor.

This is a seminar course in organization and administration designed to prepare personnel for administrative roles in special education. Areas of major concerns to special education administrators will be explored and various approaches to handling problems examined.

ED 675. LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Must be preceded by ED 329, its equivalent, or admission by consent of instructor.

Research, recent trends and current developments in the field of language arts and implications for classroom practice in the elementary school.

ED 676. READING IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Must be preceded by ED 326, its equivalent, or admission by consent of instructor.

Research, recent trends and current developments in the field of reading instruction. Emphasis will be on improving developmental reading in the elementary school programs rather than on surveying remedial programs.

ED 677. SOCIAL STUDIES IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Must be preceded by ED 329, its equivalent, or admission by consent of instructor.

Social studies — content and place in the modern elementary education curriculum. Materials, instruction techniques, evaluation procedures, and understanding the syntax of the structure of social studies.

ED 678. SCIENCE IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Must be preceded by ED 330, its equivalent, or consent of instructor.

Analysis of historical developments and present trends in elementary school science education; the designing, implementation, and evaluation of science programs; the role of research in present and future developments.

ED 679. ELEMENTARY SCHOOL CURRICULUM. Class 3, cr. 3. Must be preceded by 12 hours in education and psychology.

Needs of children and society; modern programs; procedures for developing a curriculum, including ways to improve the present offerings of a school.

ED 680. MATHEMATICS IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Must be preceded by ED 330, or consent of instructor.

Historical and current curriculum developments in mathematics education with implications for classroom practice; analysis of instructional strategies; cognitive development; use of research results.

ED 681. IMPLICATIONS OF RESEARCH AND THEORY FOR PROBLEMS IN ELEMENTARY SCHOOLS. Class 3, cr. 3.

Identification and study of the major problems of elementary schools. Emphasis on developing problem-solving skills and their use in planning solutions to problems identified by individual students.

ED 682. INDIVIDUALIZING INSTRUCTION IN THE ELEMENTARY AND SECONDARY SCHOOL. Class 3, cr. 3. Must be preceded by completion of a teacher certification program or consent of instructor.

This course explores the foundations underlying individualized instruction, the preparation of individualized instruction materials for the classroom, the role of research in individualized instruction, and the future trends and issues in individualized instruction.

ED 686. ADVANCED STUDIES IN CHILDREN'S LITERATURE. Class 2, cr. 2-3. Must be preceded by a course in children's literature.

A critical approach to the history, trends, and literary values of children's literature as well as the place of children's literature in the elementary school curriculum. Research, current issues, media, poetry and enrichment ideas will be presented.

HEALTH, PHYSICAL EDUCATION AND RECREATION

UNDERGRADUATE LEVEL

HPER 101. HANDBALL AND RACQUETBALL. Class 1, Lab. 2, Cr. 1.

This course is designed to teach the skills involved in both handball and racquetball and to provide knowledge of the rules and appreciation of the activity that will enable a person to enjoy these sports both as participants and as spectators. The course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 102. INDIVIDUALIZED PHYSICAL FITNESS. Class 1, Lab. 2, Cr. 1.

Covers various areas of physical fitness which includes jogging, weight training, and flexibility exercises. The course will meet three times per week for one hour per day. Students will be expected to devise a realistic physical fitness program for themselves and be evaluated with pre- and post-physical fitness tests. Proper nutrition, rest, exercise, and muscle tone will be covered in the instruction. The course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 103. SOCCER AND VOLLEYBALL. Class 1, Lab. 4, cr. 2.

Theory and skill techniques in soccer and volleyball.

HPER 104. GYMNASTICS AND TUMBLING. Class 1, Lab. 4, cr. 2.

Theory and skill techniques in apparatus and tumbling.

HPER 105. PHYSICAL EDUCATION: ORIENTATION AND HISTORY. Class 2, cr. 2.

An introduction to physical education which deals with historical development and current trends in this and related fields.

HPER 106. TENNIS AND BADMINTON. Class 1, Lab. 2, Cr. 1.

Basic rules, historical development, skills, and etiquette of the activities are included in the instruction. Use of various instructional techniques and audiovisual materials along with videotape analysis of play will be included as part of the class. Emphasis will be on participation with several tournaments being conducted in each activity. The course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 107. BASIC SELF-DEFENSE. Class 1, Lab. 2, Cr. 1.

A beginning course in various methods of self-defense. Students will develop basic skills and understandings of self-defense methods. The course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 108. VOLLEYBALL AND ARCHERY. Class 1, Lab. 2, Cr. 1.

Basic instruction in volleyball and archery with the semester divided into two eight-week segments. Emphasis will be on skill development and participation. Analysis of play will be provided by videotape with instructor evaluation. Course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 109. TEAM HANDBALL. Class 1, Lab. 2, Cr. 1.

The course is designed to teach the fundamental motor skills and strategies required of team handball. The course is open to all students. Not applicable to professional education component of HPER K-12.

HPER 153. SURVEY OF SWIMMING. Lab. 3. cr. 1.

Basic competitive strokes, life saving, safety and water activities. special emphasis will be given to the teaching of swimming by prospective physical education teachers.

HPER 158. GOLF AND BOWLING. Lab. 3, cr. 1.

An introduction to the rules, etiquette and skills of golf and bowling with emphasis on actual participation.

HPER 201. OUTDOOR RECREATION AND CAMPING. Class 2, Lab. 2, Cr. 3.

Development of outdoor skills, as well as instruction in planning, organizing and leading various activities in a variety of camp programs and recreational settings. Procedures of outdoor recreation management and administration are analyzed.

HPER 204. DANCE. Class 1, Lab. 3, cr. 2.

Instruction and practical experiences in folk, square and modern dance..

HPER 205. FITNESS AND CURRICULAR ACTIVITIES. Class 1, Lab. 4, cr. 2.

Designed to increase personal fitness. Primarily concerned with improving strength, flexibility, anthropometrics, and aerobic fitness.

HPER 206. TENNIS AND BADMINTON. Class 1, Lab. 4, cr. 2.

Theory and skill techniques in tennis and badminton.

HPER 217. PHYSICAL EDUCATION PROGRAMS AND ACTIVITIES FOR ELEMENTARY SCHOOL CHILDREN. Class 1, Lab. 4, cr. 3.

A course covering various aspects of physical education in the elementary school setting. Includes formulating philosophy and objectives, selecting various games and activities, curriculum construction, teaching methods and classroom organization.

HPER 219. ISSUES AND PROBLEMS IN HEALTH. Class 3, cr. 3.

Designed to acquaint students with various aspects of personal and community health problems. Emphasis will be on current health issues such as pollution, mental health, venereal disease, aging, medical care. etc.

HPER 250. SURVEY OF SAFETY EDUCATION. Class 3, cr. 3.

An introduction to the various topics of safety and accident prevention. Analyses of accidents, safety attitudes and change of behavior, traffic surveys and school safety instruction are included.

HPER 280. PRINCIPLES OF FIRST AID. Class 1, Lab. 2, cr. 2.

A course designed to instruct all prospective teachers in the immediate and temporary care given victims of an accident or illness. Covers dressings, bandaging, artificial respiration, lacerations, insect and animal bites and other first aid topics.

HPER 301. RECREATION LEADERSHIP — SURVEY OF THE PRINCIPLES OF RECREATION. Class 3, cr. 3.

Provides instruction in various aspects of recreation. Community, school, camping, travel and leisure-time activities will be part of the instruction. Identification of the principles of recreation and the many organizations promoting recreational activities are included.

HPER 302. APPLIED ANATOMY AND KINESIOLOGY. Class 3, cr. 3.

The muscles, emphasis on their functions in and their development for specific gymnastic and athletic activities.

HPER 306. FIELD HOCKEY AND LACROSSE. Class 1, Lab. 2, cr. 1.

Skills and rules involved in field hockey and lacrosse are presented and directed at understanding of team play and an appreciation of the games both as a spectator and as a participant.

HPER 307. COACHING BASKETBALL AND ARCHERY. Class 1, Lab. 2, cr. 1.

Designed to teach the skills involved in basketball and archery and to provide a knowledge of the rules and an appreciation of the activities that will enable a student to enjoy the sports both as a participant and a spectator.

HPER 308. THE COACHING OF TRACK AND FIELD. Class 1, Lab. 2, cr. 1.

Covers various aspects of organizing, conducting practices, and handling meets. Coaching of springs, middle and long distances in addition to field events will receive primary emphasis. Construction and design of facilities along with equipment needs is an important part of the course.

HPER 309. THE COACHING OF BASEBALL AND SOFTBALL. Class 1, Lab. 2, cr. 1.

Designed to teach the skills involved in baseball and softball and to provide a knowledge of rules and an appreciation of the activities that will enable a student to enjoy the sport as a participant and a spectator.

HPER 310. PRACTICUM IN PHYSICAL EDUCATION. Class 1, Lab. 4, cr. 3.

Focus will be on actual laboratory experiences in the schools.

HPER 314. BEGINNING CONCEPTS OF ATHLETIC TRAINING — PART I. Lab. 4, cr. 2.

Instruction and experience in athletic training designed for physical education students with coaching option. Covers specific treatment and prevention of athletic injuries.

HPER 316. COACHING OF FOOTBALL AND WRESTLING. Lab. 3, cr. 1.

Designed to instruct physical education students in the basic fundamentals of coaching of football and wrestling. Course will be divided into two eight-week segments covering coaching techniques, scouting, budget and administration.

HPER 319. PHYSICAL GROWTH OF SCHOOL-AGE CHILDREN. Class 2, cr. 2.

Designed to acquaint prospective teachers with the physical growth and development of school-age children (K-12) and the implications for school health programs. Includes factors relating to posture, nutrition, allergies, communicable diseases, and special emotional problems.

HPER 360. DRIVER EDUCATION CLASSROOM PREPARATION. Class 3, cr. 3.

Classroom preparation designed to instruct prospective teachers of driver education. Deals with classroom techniques and content necessary to develop the in-class instruction phase of the program.

HPER 371. SPORTS OFFICIATING. Class 1, Lab. 2, cr. 2.

Covers the rules and methods of officiating in various sports activities. Football, basketball, wrestling, track and field, volleyball, softball, swimming and gymnastics are covered. Completion of the course will lead to Indiana High School Athletic Association certification in selected sports.

HPER 404. PRINCIPLES OF PHYSICAL EDUCATION PROGRAMS, ATHLETICS, AND COACHING. Class 2, cr. 2.

Purposes, principles and procedures of effective administration of physical education and athletics programs. Instruction in principles and practices of athletic coaching based on scientific information.

HPER 406. EVALUATION PROCEDURES IN PHYSICAL EDUCATION. Class 2, Lab. 2, cr. 3.

Designed to acquaint teaching majors with evaluating procedures necessary in physical education and allied areas. Development of test items, grading procedures, statistical methods and measurement terminology will be included.

HPER 413. ADVANCED CONCEPTS OF ATHLETIC TRAINING — PART II. Class 2, Lab. 2, cr. 3. Prerequisite: HPER 314.

An advanced course in athletic training. Adaptive physical education, physical therapy and rehabilitation are major areas of instruction.

HPER 460. MULTIPLE DRIVING RANGE INSTRUCTION. Class 3, cr. 3.

Acquaints students with various teaching methods and situations as they would occur during actual driving situations. Stoplights, railroad crossings, intersections, emergency situations, expressway ramp procedures, and highway driving using the driving range will be covered. The course is geared to instructing the prospective teacher.

HPER 461. IN-CAR DRIVER EDUCATION. Class 2, Lab. 2, cr. 3.

A course designed to provide prospective driver education students the opportunity to teach beginning students in the car. Emphasis will be on teaching techniques, safety psychophysical testing and curricular development.

HPER 474. PHYSIOLOGICAL PRINCIPLES OF EXERCISE. Class 2, cr. 2.

Scientific study of human performance relating to training methods and effects of athletic performance. Designed to acquaint students with physiological principles and sound coaching techniques.

DUAL LEVEL
Undergraduate-Graduate

PE 503. CURRICULUM CONSTRUCTION IN PHYSICAL EDUCATION. Class 3, cr. 3.

Curriculum planning and development with emphasis on the genetic approach. Programs from elementary school through the university level.

PE 505. SUPERVISION OF PHYSICAL EDUCATION. Class 3, cr. 3.

Principles of supervision of activities and programs in physical education. Special emphasis is given to junior high school and senior high school areas.

PE 507. HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION. Class 3, cr. 3.

Must be preceded by at least 18 semester hours in science, 12 semester hours in education, and 24 semester hours physical education, or equivalents.

GRADUATE LEVEL

H&S 605. SEMINAR IN SAFETY EDUCATION. Class 3, cr. 3. Prerequisite: six hours of safety education, of which at least three hours must be in driver education. The critical analysis of current problems in safety education related to teaching and administering safety programs in the schools.

DEPARTMENT OF ENGLISH AND PHILOSOPHY

J. S. Tuckey, Head

FACULTY: J. B. Allison, J. Campbell, J. C. Carlisle, G. R. Fischer (Emeritus), B. G. Gawthrop, R. A. Geimer, A. G. Gross, T. R. Koenig, S. A. Lovin-Boyd, Z. J. Mistri, P. A. Moran, R. E. Nichols, Jr., D. R. Oldfather, S. E. Pauley, L. M. Preston, E. M. Schwartz, R. L. Selig, B. A. Smith, C. S. Stacy, S. Stark (Emeritus), S. F. Staton, C. B. Tinkham, J. S. Tuckey.

The Department of English and Philosophy offers a wide range of courses in writing, language, literature, and philosophy which, in conjunction with the general education requirements of the University and of the School of Humanities, Education and Social Sciences, lead to the Bachelor of Arts degree in English or English Teaching and to minors in English, English Teaching and Philosophy. In addition, the department offers a selected series of graduate-level English courses which lead to the Master of Arts degree in English. The department endeavors to help the student achieve: (1) a general historical knowledge of the language and literature of England and the United States; (2) an understanding and appreciation of philosophy and of literature as a fine art; (3) an ability to read and evaluate the written word; and (4) skill and grace in oral and written communication.

Although the major frequently applies such collegiate study to a career in education or editorial work, the program itself exists to sharpen powers of analysis, heighten communicative abilities, and broaden the cultural awareness, and the undergraduate may further widen the cultural scope or introduce a measure of specialization by tailoring the program to include a minor in another field of the humanities, in social science or in education, or even in such disciplines as physical and biological sciences or home economics. The goal of the program is preparation for life and the professions through a liberal education.

Requirements for the English Major

English Core (21 Hours): Required of all English majors

1)	201	Nature of Literary Study	3
2)	240 & 241	Introduction to English Literature	6
3)	350 & 351	Introduction to American Literature	6
4)	326	English Linguistics	3
5)	442	Shakespeare	3
			21

A. Literature Focus (12 hours)

1) Twelve hours in literature courses beyond those in the English CORE requirements. May include up to six hours in writing courses. 12

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B. Writing Focus (12 hours)

1) Twelve hours in writing courses beyond freshman composition. Must include at least one course in creative writing (such as 405 or 507) and one course in commercial writing (such as 420 or 252). 12

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C. Teaching Focus

1) Department of English requirements:

ENGL 201 Nature of Literary Study	3
ENGL 240 English Literature (early)	3
ENGL 241 English Literature (late)	3
ENGL 326 English Linguistics	3
ENGL 350 American Literature (early)	3
ENGL 351 American Literature (late)	3
ENGL 442 Shakespeare	3
ENGL 491 Teaching Composition	3
COM 252, 357, 452 (Journalism)	3
ENGL 405, 507, 508, 509, or 589 (Creative Writing)	3
ENGL 260 **or** 261	3
ED 581 Media for Young Adults **or**	3
English elective	6
	39

2) Education Requirements:

a. Education (25 semester hours): Education 101, 202, 203, 220, 221, 302, 303, 336, 341, 424B, 491.
b. Mathematics and science (12 hours): three semester hours in mathematics; three in life sciences; three in physical sciences; an additional three semester hours in any one of these three areas.
c. Application for admission to teacher education (in sophomore year).

NOTE: Other requirements are automatically met through the General Education (CORE) Requirements of the School of Humanities, Education, and Social Sciences.

Students desiring to complete a teacher education program with a major or minor area in English Teaching must maintain a 4.25 grade average both in their over-all graduation index and in English courses.

Requirements for the English Minor:

A. English Minor (12 semester hours):
Any twelve hours beyond Freshman Composition. The student may concentrate in one area (such as Reading, Writing, Literature, Linguistics, or Popular Culture) or range across areas. The English Department advisor will be glad to suggest possible concentrations.

B. English Teaching Minor (24 semester hours):

1) Department of English Requirements:

a. ENGL 201 Nature of Literary Study	3
b. ENGL 326 English Linguistics	3
c. ENGL 491 Composition for English Teaching Majors	3

d. Literature (9 semester hours):

	ENGL 240 **or** ENGL 241	3
	ENGL 350 **or** ENGL 351	3
	One of the following: ENGL 260, 261, 357, **or** 442	3
e.	COM 114 Fundamentals of Speech Communication	3
f.	COM 252 News Reporting	3
		24

2) Department of Education Requirements:
   a. Education 341

Requirements for the Philosophy Minor:

Any twelve hours in Philosophy beyond the CORE requirement of the School of Humanities, Education, and Social Sciences.

UNDERGRADUATE LEVEL

Lower-Division Courses

ENGL 018. FUNDAMENTALS OF READING. Class 3, cr. 0.

Aims to build the student's functional reading level to meet the requirements of college textbooks. Stresses improvement of the basic silent reading skills of word recognition, vocabulary building, literal comprehension and rate fluency. Some instruction in study techniques. Individualized and performance oriented.

ENGL 100. ENGLISH COMPOSITION. Class 3, Lab. 2, cr. 3.

This course is the equivalent of English 104 for freshmen whose test scores indicate a need for directed practice in the patterns of English prose and a review of fundamentals in English as applied in writing, in addition to the regular work that is assigned in English 104. Emphasis on the organization of expository paragraphs and the expository theme. Directed writing and revising of themes. Review of grammar, spelling and mechanics.

ENGL 103. ADVANCED FRESHMAN COMPOSITION. Class 3, cr. 3.

A composition course for freshmen who have shown their superior writing ability by their high school achievement and their score on the verbal section on the College Entrance Examination. The course emphasizes expository writing on a high critical level and includes readings of essays and imaginative literature involving conflicting intellectual attitudes as subjects for writing.

ENGL 104. ENGLISH COMPOSITION I. Class 3, cr. 3. Prerequisite for all courses in English except ENGL 100, 103, 185, and 286.

Emphasis on the organization of the expository theme. Directed writing of themes based on personal experience, on the relationship between experience and language, and on the relationship between experience and ideas.

ENGL 105. ENGLISH COMPOSITION II. Class 3, cr. 3. Not open to students who have earned a grade of C or higher in ENGL 103.

The second half of the basic composition sequence. Emphasis on the logical and rhetorical problems involved in writing discursive essays. Directed writing of themes based largely on reading of discursive prose and imaginative literature. Normally to be taken immediately following ENGL 104 in the freshman year. A student who has received a grade of A in ENGL 104 may with the approval of his 104 instructor and his school substitute for ENGL 105 an elective course in English, usually a 200-level literature course.

ENGL 183. STUDY SKILLS AND VOCABULARY. Class 1, Lab. 2, cr. 1.

To develop such study methods as effective listening and note-taking, time-budgeting, test-taking, library usage, interpreting graphics, and techniques to improve concentration, retention, and review of materials; to build reading vocabulary through word analysis and practical context training.

ENGL 184. READING FOR COMPREHENSION. Class 1, Lab. 2, cr. 1.

To improve comprehension and develop effective reading techniques. Emphasis on recognizing main ideas and significant details, and on grasping organizational patterns through close analysis of textbooks and other materials.

ENGL 185. DEVELOPMENTAL READING. Lab. 2, cr. 1.

Purpose: to increase reading efficiency by improving comprehension and by developing the motor skills involved in reading speed. Motivates reading interest through use of films and pacers.

ENGL 186. COLLEGE READING AND STUDY SKILLS. Class 3, Lab. 1, cr. 3.

Emphasizes development of effective textbook reading and review strategies, acquisition of college-level vocabulary, utilization of library resources, improvement of such classroom learning skills as lecture note-taking and test-taking.

ENGL 201. THE NATURE OF LITERATURE STUDY. Class 3, cr. 3.

A study of literary concepts and critical procedures as applied to representative poetry, fiction, and drama, with practice in critical writing.

ENGL 220. TECHNICAL REPORT WRITING. Class 3, cr. 3.

A study of application of the principles of good writing in industrial reporting with emphasis on the techniques of presenting information graphically as well as in a clear, concise written form.

ENGL 222. ENGINEERING WRITING. Class 3, cr. 3.

Study and application of the principles of writing engineering reports. Emphasis on report format, research and documentation, and the role of figures and tables. Prerequisite: ENGL 104 or equivalent.

ENGL 230. GREAT NARRATIVE WORKS. Class 3, cr. 3. Not open to students with credit for ENGL 238.

Reading and discussion of major works in English, America, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on types of narrative literature.

ENGL 231. INTRODUCTION TO LITERATURE. Class 3, cr. 3.

Reading and discussion of major works in English, American, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on various types of literature.

ENGL 232. THEMATIC STUDIES IN LITERATURE. Class 3, cr. 3. (May be repeated for credit.)

Examination of a particular theme, such as the hero, death, or the city, and the techniques by which it is treated in various literary works, usually in more than one genre.

ENGL 235. INTRODUCTION TO THE DRAMA. Class 3, cr. 3.

Reading and discussion of a number of plays, most of them modern, aimed at an appreciation of the drama as literature and as entertainment.

ENGL 237. INTRODUCTION TO POETRY. Class 3, cr. 3.

How to read poetry intelligently; function of description, metrics, figures of speech, and theme; place of a poem in history, uses of poetry, etc.

ENGL 238. INTRODUCTION TO FICTION. Class 3, cr. 3.

Reading and discussion of selected short stories and several novels, to promote awareness, understanding, and appreciation of the range, values, techniques, and meanings of reputable modern fiction.

ENGL 240. SURVEY OF THE LITERATURE OF ENGLAND: FROM THE BEGINNINGS THROUGH THE NEO-CLASSICAL PERIOD. Class 3, cr. 3.

An introduction to English literature from the Anglo-Saxon age through the eighteenth century neo-classical period, with emphasis on such major writers as Chaucer, Spenser, Shakespeare (non-dramatic work), Donne, Milton, Dryden, Pope, and Johnson. The course also treats significant minor writers in their relation to literary movements and ideas.

ENGL 241. SURVEY OF THE LITERATURE OF ENGLAND: FROM THE RISE OF ROMANTICISM TO THE MODERN PERIOD. Class 3, cr. 3.

A continuation of ENGL 240, this course surveys English literature (excluding the novel) from the late eighteenth century to the twentieth century, with emphasis on such major writers as Blake, Wordsworth, Keats, Tennyson, Arnold, Hardy, Yeats, T. S. Eliot, and Auden. The course also treats significant minor writers in their relation to literary movements and ideas.

ENGL 242. SHAKESPEARE FOR NON-ENGLISH MAJORS. Class 3, cr. 3.

An introduction to Shakespeare intended to fulfill the literature or cultural requirement for non-English majors. Six or seven plays are covered. Lectures and discussions are supplemented with recordings and/or films of productions. Not applicable to English majors. Not open to students with credit in ENGL 442, 542, or 543.

ENGL 250. GREAT AMERICAN BOOKS. Class 3, cr. 3.

Several books, such as *The Scarlet Letter*, *Moby Dick*, and *Walden*, read and discussed as to their literary qualities and their cultural significance.

ENGL 260. INTRODUCTION TO WORLD LITERATURE: TO 1800. Class 3, cr. 3.

A comparison of some of the major works of world literature in translation, from the beginnings to 1800. Emphasis on Greek. Roman, Eastern and early European literature.

ENGL 261. INTRODUCTION TO WORLD LITERATURE: SINCE 1800. Class 3, cr. 3.

A comparison of some of the major works of world literature in translation, from 1800 to present. Emphasis on Continental, African, Latin-American and Eastern literature.

ENGL 262. GREEK AND ROMAN CLASSICS IN TRANSLATION. Class 3, cr. 3.

Study of important works of Greek and Roman literature, their intrinsic literary values, and their influence on later European and American writing and thinking.

ENGL 264. THE BIBLE AS LITERATURE. Class 3, cr. 3.

A study of selections from the old and new testaments as examples of Hebrew and early Christian literature.

ENGL 285. CRITICAL READING. Class 2, cr. 2. Prerequisite: ENGL 185, or consent of instructor.

Close reading of selected current magazines and newspapers, emphasizing efficient techniques for finding general meaning. Includes the application of elementary logical and semantic analysis.

ENGL 286. VOCABULARY BUILDING. Lab. 2, cr. 1.

Development of vocabulary through study of the characteristics of the language, usage, and word formation; exercises and dictionary practice; selected reading.

UNDERGRADUATE LEVEL
Upper-Division Courses

(General prerequisite for all English courses numbered from 300 to 499; fulfillment of the basic composition requirement.)

ENGL 304. ADVANCED COMPOSITION. Class 3, cr. 3.

Designed for students who wish additional training in composition beyond the basic requirements. Extensive practice in the writing of mature expository, critical, and argumentative prose.

ENGL 326. ENGLISH LINGUISTICS. Class 3, cr. 3.

An introduction to the nature and structure of language, as well as the study of dialects, semantics, and history of the language.

ENGL 327. ENGLISH LANGUAGE I: HISTORY AND DEVELOPMENT. Class 3, cr. 3.

History and rationale of the scientific study of English and a survey of the development of English sounds, inflections, syntactical patterns, and vocabulary.

ENGL 328. ENGLISH LANGUAGE II: DESCRIPTION AND ANALYSIS. Class 2, Lab. 2, cr. 3.

Application of structural analysis to American English in light of the constructive criticism offered by traditional, generative-transformational, and other grammars. Relevance of recent study to the teaching of English.

ENGL 350. SURVEY OF AMERICAN LITERATURE FROM ITS BEGINNINGS TO 1865. Class 3, cr. 3.

An introduction to American literature from the Colonial Period to the Civil War, emphasizing such major literary figures as Edward Taylor, Franklin, Poe, Hawthorne, Melville, Emerson, Thoreau, and Whitman. The course also treats significant minor writers in their relation to literary movements and ideas and includes the work of minority writers.

ENGL 351. SURVEY OF AMERICAN LITERATURE FROM 1865 TO THE POST WORLD WAR II PERIOD. Class 3, cr. 3.

A continuation of ENGL 350, this course surveys American literature from the Civil War to recent times, emphasizing such major literary figures as Dickinson, Twain, James, Crane, Frost, T. S. Eliot, Fitzgerald, Hemingway, and Faulkner. The course also treats significant minor writers in their relation to literary movements and ideas and includes the work of minority writers.

ENGL 357. LITERATURE OF BLACK AMERICA. Class 3, cr. 3.

An examination of the literary, social, and historical importance of American literature by and about the American Negro. Readings will range from the earliest American period to the present with attention when appropriate to "sub literary" work such as folk literature and the rhetoric of spokesmen of the race question.

ENGL 372. INTRODUCTION TO AMERICAN FOLKLORE. Class 3, cr. 3.

Introduction to the study of Anglo-American traditions, folk tale, song, dance, humor, superstition, games, beliefs, etc., with emphasis on informal discussion of readings, recordings, movies, and lectures.

ENGL 376. THE MOVIES. Class 2, Lab. 3, cr. 3.

The history and aesthetics of the movies from *The Great Train Robbery* and *The Birth of a Nation* or *Intolerance* to contemporary films. Comparison of the cinematic methods with the methods of the drama and the novel. One afternoon or evening a week for the screening of films; two periods a week for discussion.

ENGL 377. MAJOR MODERN POETRY. Class 3, cr. 3.

The development of new trends in and the interrelationships among the poetry of Ireland, Britain, and the United States. Poets central to modernism, such as Yeats, Pound, Eliot, Williams, and Stevens will be emphasized, and students will also read more recent poets.

ENGL 381. THE BRITISH NOVEL. Class 3, cr. 3.

A survey of representative British novels of the eighteenth and nineteenth centuries by such authors as DeFoe, Fielding, Austen, Dickens, Eliot, and Hardy.

ENGL 382. THE AMERICAN NOVEL. Class 3, cr. 3.

A survey of representative American novels of the nineteenth and twentieth centuries by such authors as Cooper, Hawthorne, Melville, Twain, James and Faulkner.

ENGL 386. HISTORY OF THE FILM TO 1938. Class 3, Lab. 2, cr. 3. Prerequisite: consent of instructor.

A survey of the American and European cinema from its origins in technology and realism to the aesthetic implications presented by the coming of sound. Emphasis on the feature film and on the prevalent aesthetic attitudes in the first decades of the motion picture.

ENGL 387. HISTORY OF THE FILM FROM 1938 TO THE PRESENT. Class 3, Lab. 2, cr. 3. Prerequisite: consent of instructor.

A survey of international cinema for the period indicated. Emphasis on the feature film and its development as a communication tool, popular art form, medium of personal expression, and self-exploring linguistic system.

ENGL 396. STUDIES IN LITERATURE AND LANGUAGE. Class 3, cr. 3.

A course in the study of a special topic directed by an instructor in whose particular field of specialization the content of the course falls.

ENGL 405. CREATIVE WRITING. Class 3, cr. 3. (May be repeated for credit.)

Informally conducted for students who enjoy writing — of any kind except the narrowly technical — and concerned with problems of form, style, diction, sentence structure. Workshop criticism.

ENGL 420. BUSINESS WRITING: GENERAL APPLICATIONS. Class 3, cr. 3.

Application of business writing principles to the preparation of common letter types, reports, and advertising copy. Sales, adjustment, collection, and employment letters are stressed.

ENGL 421. TECHNICAL WRITING: ENGINEERING AND SCIENCE APPLICATIONS. Class 3, cr. 3.

Study of the types of letters and reports in engineering. Practice in their preparation. Consideration of the qualities found in engineering papers.

ENGL 422. INDUSTRIAL WRITING. Class 3, cr. 3.

Application of technical and business writing principles to the preparation of memorandums, reports, and letters written by engineering technologists in the day-to-day performance of their work in industry. Includes practice in the use of figures and tables.

ENGL 442. SHAKESPEARE. Class 3, cr. 3.

Shakespeare's dramatic craftsmanship, poetry, humor, characterization, psychology, and modern pertinence illustrated in representative tragedies, comedies, and history plays.

ENGL 455. MAIN CURRENTS OF AMERICAN THOUGHT. Class 3, cr. 3.

A survey of dominant ideas and intellectual trends in America from 1607 to the present as revealed through American literature and as related to American life and culture.

ENGL 456. AMERICAN HUMOR. Class 3, cr. 3.

Humorous writings of the nineteenth and twentieth centuries are studied as to form and technique and also as a reflection of American life. Special emphasis on Mark Twain.

ENGL 479. THE SHORT STORY. Class 3, cr. 3.

A historical and critical study of nineteenth- and twentieth century short stories — Irish, British, American, and Continental.

ENGL 491. COMPOSITION FOR ENGLISH TEACHING MAJORS. Class 3, cr. 3.

Intensive practice in writing exposition and in annotating high school students' compositions.

ENGL 493. DIRECTED READING. Cr. 1-3. Admission by consent of instructor. (May be repeated for credit.)

Directs the reading of students with special interests. Guides students in profitable reading in subjects of their own choice. Individual conferences only — no class meeting.

DUAL LEVEL
Undergraduate-Graduate

(General prerequisite for all English literature courses numbered above 500: fulfillment of the basic composition requirement and six hours of literature, or permission of the instructor.)

ENGL 506. ENGLISH LINGUISTICS. Class 3, cr. 3.

Summary of ways of approaching language study, historical and descriptive analysis of English. Comparison of traditional, structural, and generative grammars. Survey of current research.

ENGL 507. POETRY WRITING. Class 3, cr. 3. Admission by consent of instructor after submission of manuscripts. (May be repeated for credit.)

Writing of poems with a view to publication in the literary journals and "little" magazines. Criticisms by class and instructor. Sampling of current poetry publication.

ENGL 509. SHORT STORY WRITING. Class 3, cr. 3. Admission by consent of instructor. (May be repeated for credit.)

Writing of several short fictional narratives. Study of short story techniques, particularly in these manuscripts. Cooperative criticism by class and instructor.

ENGL 510 HISTORY OF THE ENGLISH LANGUAGE. Class 3, cr. 3. Must be preceded by ENGL 506 or AUSL 530 or consent of instructor.

Introduction to theories of linguistic change and their application to the historical development of English from its beginnings.

ENGL 512. THE GRAMMAR OF MODERN ENGLISH. Class 3, cr. 3. Must be preceded by ENGL 506 or AUSL 580 or consent of instructor.

Detailed examination of the semantic, syntactical, morphological and phonological structures of English. Comparison of various approaches to grammatical analysis and description.

ENGL 514. DIALECTS OF AMERICAN ENGLISH. Class 3, cr. 3. Must be preceded by ENGL 506 or AUSL 580, or consent of instructor.

Introduction to the geographical, social, and stylistic variations of American English dialects. Survey of formal devices proposed to explain these variations. Discussion of social and pedagogical implications.

ENGL 515. BUSINESS WRITING: JOURNALISTIC APPLICATIONS. Class 3, cr. 3.

Study of the aims, functions, and organization of technical journals, company publications, and trade journals; writing of articles and other papers slanted toward such publications.

ENGL 525. MIDDLE ENGLISH. Class 3, cr. 3.

A study of selected readings from the literature of about 1100 to about 1500. Emphasis on the language.

ENGL 531. THE ENGLISH NOVEL THROUGH 1800. Class 3, cr. 3.

A study of such novelists as Defoe, Richardson, Fielding, Smollett, Sterne, and Austen.

ENGL 532. THE ENGLISH NOVEL IN THE NINETEENTH CENTURY. Class 3, cr. 3.

A survey of fiction up to about 1800, including such novelists as Scott, Dickens, Thackery, the Brontes, Eliot, and Meredith.

ENGL 533. TUDOR LITERATURE. Class 3, cr. 3.

Nondramatic literature of the English Renaissance up to 1603, particularly the Elizabethan. Representative selections in both prose and verse are studied, with special attention to Spenser, Sidney, and Shakespeare.

ENGL 535. RESTORATION AND EARLY EIGHTEENTH-CENTURY LITERATURE. Class 3, cr. 3.

A survey of the nondramatic literature from 1660 to 1744, from Clarendon through Thompson. Emphasizes Bunyan, Dryden, Pope, Swift.

ENGL 536. LATER EIGHTEENTH-CENTURY LITERATURE. Class 3, cr. 3.

A survey of the nondramatic literature from 1744 to 1798, from Young through Gibbon and Cowper. Excludes the novel. Emphasizes Johnson and his circle and Gray and his circle.

ENGL 537. ENGLISH DRAMA TO 1642. Class 3, cr. 3.

A survey of the English drama from the beginning, through Marlowe and Jonson, to the closing of the theaters (excluding Shakespeare).

ENGL 538. ENGLISH DRAMA FROM THE RESTORATION TO THE MODERN PERIOD. Class 3, cr. 3.

A survey of the English drama from Dryden and Wycherley through Robertson and Pinero.

ENGL 541. CHAUCER. Class 3, cr. 3.

Intensive study of the development of Chaucer's literary work with consideration of his language, his sources, and various critical approaches to his poetry.

ENGL 542. SHAKESPEARE'S COMEDIES AND TRAGI-COMEDIES. Class 3, cr. 3.

A study of the development of Shakespeare's comic art from the early comedies through the later comedies and tragi-comedies. Ten to 12 plays will be read.

ENGL 543. SHAKESPEARE'S TRAGEDIES AND HISTORY PLAYS. Class 3, cr. 3.

A study of the early and mature tragedies, the English histories, and the Roman plays. Ten to 12 plays will be read.

ENGL 547. THE ROMANTIC MOVEMENT IN ENGLISH LITERATURE. Class 3, cr. 3.

Principal writers of the Romantic Movement (Burns to Keats), emphasizing Wordsworth; relation of the historical background to the thought and feeling of the writers concerned.

ENGL 548. VICTORIAN LITERATURE. Class 3, cr. 3.

A survey of English poetry and prose from about 1832 to 1880.

ENGL 549. LATE VICTORIAN AND EDWARDIAN LITERATURE. Class 3, cr. 3.

A study of the rebellion against Victorian conventions which characterized the period from 1880 to 1910. Such movements as aestheticism, decadence, symbolism, and naturalism are examined in the works of Hardy, Yeats, Butler, Wilde, and others.

ENGL 553. COLONIAL AND EARLY AMERICAN LITERATURE. Class 3, cr. 3.

A survey of American literature from the beginning to about 1820, concluding with such writers as Brackenridge, Brown, and Tyler.

ENGL 554. THE AMERICAN RENAISSANCE. Class 3, cr. 3.

A survey of American literature from about 1820 to 1855, concluding with Melville.

ENGL 556. NINETEENTH-CENTURY AMERICAN FICTION. Class 3, cr. 3.

Surveys the development of American fiction from its beginnings. Though representative

works of all periods will be read, emphasis will be given to Hawthorne, Melville, Twain, and James.

ENGL 558. THE RISE OF REALISM IN AMERICAN LITERATURE. Class 3, cr. 3.

A survey of American literature from about 1855 to 1900, beginning with Whitman and ending with James and the early naturalists.

ENGL 559. TWENTIETH-CENTURY AMERICAN LITERATURE. Class 3, cr. 3.

A survey of the major literary genres — poetry, fiction, drama, essays, and criticism — since 1900.

ENGL 575. MODERN AMERICAN DRAMA. Class 3, cr. 3.

Representative plays by major American playwrights from 1920 to the present.

ENGL 576. PHILOSOPHY AND LITERATURE. Class 3, cr. 3. Prerequisite: six hours of philosophy or six hours of literature, or three hours of each, or permission of instructor.

(Same as PHIL 576.) An intensive examination of the structure of literature, the bearing of literary style on philosophical ideas, and the application of philosophical categories to literary criticism.

ENGL 577. MODERN ENGLISH AND AMERICAN POETRY. Class 3, cr. 3.

Surveys modern poetry from Hardy to Auden; relates it to the main currents of contemporary thought and feelings; introduces elementary critical principles.

ENGL 578. MODERN AMERICAN FICTION. Class 3, cr. 3.

Critical study of twentieth-century novels and short stories, including works by such writers as James, Faulkner, and Hemingway.

ENGL 579. MODERN BRITISH FICTION. Class 3, cr. 3.

Critical study of twentieth-century novels and short stories by such writers as Conrad, Lawrence, and Forster. Special attention is given to James Joyce's *Ulysses*.

ENGL 587. DEVELOPMENTAL READING FOR TEACHERS. Class 2, Lab. 2, cr. 3. Techniques for improving reading skills.

Introduction to laboratory method. Research and reading in the field, and interning in the laboratories. Recommended for prospective teachers of reading.

ENGL 589. DIRECTED WRITING. Cr. 1-3. Prerequisite: consent of the instructor. (May be repeated for credit.)

Writing — creative, popularly technical, biographical, historical, philosophical — on subjects of the student's choice. Individual conferences only. No class meetings.

ENGL 590. DIRECTED READING. Cr. 1-3. Admission by consent of instructor.

Directs the reading of students with special interests. Guides students in profitable reading in subjects of their own choice. Individual conferences; no class meetings. May be repeated for credit.

ENGL 593. CONTEMPORARY BRITISH FICTION. Class 3, cr. 3.

Critical study of the British novel since World War II. Survey of scholarship and criticism. Examinations and critical papers.

ENGL 594. CONTEMPORARY POETRY. Class 3, cr. 3.

American and foreign poetry of the past two decades. Attention to influences, "schools," and poetry magazines. Outside reading. Critical papers.

ENGL 595. CONTEMPORARY AMERICAN FICTION. Class 3, cr. 3.

Study of fiction of the past two or three decades as it relates to American literary traditions and thought. Survey of scholarship and criticism. Examinations and critical papers.

ENGL 596. ADVANCED STUDIES IN LITERATURE AND LANGUAGE. Class 3, cr. 3.

A course in the study of a special topic directed by an instructor in whose particular field of specialization the content of the course falls. Emphasis on critical analysis, scholarly techniques, and secondary materials.

GRADUATE LEVEL

ENGL 601. METHODS OF LITERARY STUDY. Class 3, cr. 3.

Introduction to the tools and techniques of literary research, including the study of methods of bibliography, varying critical approaches, and the writing of scholarly papers.

ENGL 627. SEMINAR IN ENGLISH LINGUISTICS. Cr. 3.

Investigation into various aspects of linguistics. Problems arising from research interests of individual students.

ENGL 642. SEMINAR IN SHAKESPEARE. Cr. 3.

Practice in the most successful modern methods of Shakespeare scholarship and criticism study of text, sources, staging, dramatic technique, language, thought, etc. Normally three or four plays will be examined intensively from these points of view.

ENGL 649. SEMINAR IN ENGLISH LITERATURE 1880-1920. Cr. 3.

Subjects will range from individual authors and specific literary types to transitional literary movements.

ENGL 657. SEMINAR IN AMERICAN LITERATURE BEFORE 1900. Cr. 3.

A variable course content ranging from the colonial period in American letters to the turn of the twentieth century. Authors, ideas, types of literature, and significant literary movements will be variously explored.

ENGL 678. SEMINAR IN MODERN AMERICAN FICTION. Cr. 3.

Intensive study of one or two authors, of a limited period, or of themes and movements. Oral reports and research papers required. May be repeated for credit.

ENGL 679. SEMINAR IN MODERN BRITISH FICTION. Cr. 3.

Study in depth of one or two major novelists, a literary movement, a group of writers, or a form of modern fiction. Oral reports and research papers required. May be repeated for credit.

ENGL 691. SEMINAR IN THE ENGLISH LANGUAGE ART. Class 3, cr. 3.

Problems in the teaching of English: literature, language, rhetoric. Attention to recent scholarship and to its application in the public schools. May be repeated for credit with the permission of the instructor.

ENGL 696. SEMINAR IN LITERATURE. Cr. 3.

Advanced study of special subjects.

ENGL 698. RESEARCH. M.A. Thesis.

PHILOSOPHY COURSES

UNDERGRADUATE LEVEL

PHIL 106. HUMAN EXPERIENCE IN ART, LITERATURE, MUSIC AND PHILOSOPHY. Class 3, cr. 3.

An introductory exploration of some of the pervasive experiences and ideas which lie at the heart of all the humanities (e.g. love, death, justice, duty, nature, beauty, and deity) using as materials specimens of the visual arts, music, literature and philosophy.

PHIL 110. INTRODUCTION TO PHILOSOPHY. Class 3, cr. 3.

The basic problems and types of philosophy, with special emphasis upon the problem of knowledge and nature of reality.

PHIL 111. ETHICS. Class 3, cr. 3.

A study of the nature of moral value and obligation. Topics such as the following will be considered: different conceptions of the good life and standards of right conduct; the relation of non-moral and moral goodness; determinism, free will, and the problem of moral responsibility; the political and social dimensions of ethics; the principles and methods of moral judgment. Readings will be drawn both from contemporary sources and from the works of such philosophers as Plato, Aristotle, Aquinas, Butler, Hume, Kant, and J.S. Mill.

PHIL 150. PRINCIPLES OF LOGIC. Class 3, cr. 3.

A study of the principles and methods employed in the logical appraisal of arguments. Topics such as the following will be considered: semantic principles and problems; informal fallacies; syllogistic logic; truth-functional logic; the logic of quantification; and inductive logic.

PHIL 201. HISTORY OF ANCIENT PHILOSOPHY. Class 3, cr. 3.

A survey of ancient western philosophy from Thales through Plotinus. Selected readings, examinations, and essays on the pre-Socratic philosophers, Plato, Aristotle, and Hellenistic and Roman philosophy.

PHIL 203. HISTORY OF MODERN PHILOSOPHY. Class 3, cr. 3.

Readings in, lectures on, and discussions about the major and minor philosophical figures from the Renaissance through Kant. This includes fairly intensive study of the works of Descartes, Spinoza, Leibnitz, Locke, Berkeley, Hume and Kant. Contemporary nonphilosophical figures such as Newton and Calvin are also considered.

PHIL 206. PHILOSOPHY OF RELIGION. Class 3, cr. 3.

The nature and origin of religion. A critical examination of the idea of God, the nature of evil, immorality, and worship.

PHIL 251. AN INTRODUCTION TO THE PHILOSOPHY OF SCIENCE. Class 3, cr. 3.

A survey of the major historical and contemporary views of science with emphasis on its goals and limitations, its concepts, problems, methods, its varieties and its place in human life.

PHIL 307. CURRENT TRENDS IN PHILOSOPHY. Class 3, cr. 3.

Readings in contemporary and recent philosophy in America and other English speaking countries, emphasizing its richness, variety and technical excellence.

PHIL 320. INTRODUCTION TO EXISTENTIALISM. Class 3, cr. 3.

A survey of the problems, methods and main themes of the existential movement in literature and philosophy. Readings and discussion of 19th century writers such as Kierkegaard, Nietzsche, Dostoevsky and Tolstoy and 20th century representatives such as Heidegger, Jaspers, Marcel, Sartre, Camus and Ortega y Gasset.

DUAL LEVEL
Undergraduate-Graduate

PHIL 590. DIRECTED READING IN PHILOSOPHY. Cr. 1-3. Admission by consent of instructor. Must be preceded by six hours of philosophy, plus basic work in area to be investigated. (May be repeated for credit.)

A reading course directed by the instructor in whose particular field of specialization the content of the reading falls. Approval of each reading project must be secured from the department.

DEPARTMENT OF FOREIGN LANGUAGES AND LITERATURES

A. J. Russell, Acting Head

FACULTY: W. R. C. Ade (Emeritus), M. Bolduc, B. Kienbaum, A. Lamb, M. Niño, C. Ruiz, A. Russell

The Department of Foreign Languages and Literatures offers courses in French, German, and Spanish leading to baccalaureate degrees. Students use their language skills to prepare for positions in government, travel, social work, business, and communications. A language program in International Studies is a career-oriented foreign language program designed to provide a basic educational experience for undergraduate students who wish to work in the field of international business. The goal of this curriculum is to prepare the student to be able to work in industry and in corporations with international departments. An internship is an integral part of the program. Students prepare for a career in teaching at the secondary school level by fulfilling the professional education requirements. An endorsement to the elementary education license in Bilingual/Bicultural Education is offered in cooperation with Indiana University Northwest. Minors in the languages and in foreign language teaching are also available.

Courses in Latin, literature in translation, and comparative linguistics are offered for cultural and intellectual enrichment. Courses in English as a Foreign Language provide the opportunity to speakers of other languages to learn the basic skills of the English language.

Graduate courses are offered in French, German and Spanish for those who wish to earn credit for advanced degrees or who desire to refresh their knowledge of these languages and their literatures.

Foreign Language Major

Total credit hour requirement for the Major, 33 credit hours beyond 204. A minor is required with the major.

I. Required Courses:

a.	261 Composition	3 credits
b.	365 Conversation	3
c.	465 Intermediate Conversation	3
		9 credits

II. Eighteen credit hours from any combination of courses numbered 400 or higher.

III. Six credit hours in another foreign language.

Foreign Language — International Studies Areas

Total requirement, 45 credit hours as follows:

I. Foreign Languages (French, German, or Spanish) — 21 credits

261 — Composition	3
307 — Commercial French, German, Spanish	3
308 — Practicum in International Companies	3
365 — Conversation	3
450 — Civilization (or SPAN 451 or 550, or Culture 552, or SPAN 413)	3
465 — Intermediate Conversation	3
One course numbered 400 or higher	3
	21 credits

II. History and Political Science — 12 credits

Six credits from the following courses in History:

HIST 272 — Latin American History from 1824	
HIST 472 — History of Mexico	
HIST 491 — Topics in European History	
HIST 525 — Problems in Twentieth Century German History	
HIST 529 — European International Relations and Power Politics	
HIST 552 — Europe Since 1914	
HIST 570 — History of U.S. Latin American Relations	
HIST 577 — Contemporary Latin America	
HIST 579 — National Latin America	
HIST 587 — Twentieth Century U.S. Foreign Affairs	
HIST 590 — Modern Germany	
	6

Six credits from the following courses in Political Science

POL 231 — Introduction to U.S. Foreign Policy	
POL 433 — International Organization	
POL 435 — International Law	
POL 530 — Theories of International Relations	
	6
	12 credits

III. Business — Economics — 12 credits

Twelve credits from the following courses:

ECON 251 — Microeconomics	
ECON 352 — Intermediate Macroeconomics	
ECON 434 — International Trade	
ECON 530 — Money and Finance	
ECON 534 — International Trade Theory	
ECON 535 — Current World Economic Problems	
ECON 585 — The U.S. and the World Economy in Recent Times	
	12 credits

IV. It is highly recommended that each student take CIS 115 or CIS 205, ENGL 420, and a minor in one of the following areas: Communication, Political Science,

History, a second Foreign Language, Management, Accounting, Finance, Labor, or Marketing.

Foreign Language Teaching Major

Total requirement, 33 hours beyond 204.

I. Required Courses:

a. 261 Composition	3 credits
b. 365 Conversation	3
c. 465 Intermediate Conversation	3
	9 credits

II. Twenty-four hours of courses numbered 400 or above. These must include: 450, Civilization (Span 451 or 550); 552, Culture (or Span 413); 461, Intermediate Composition; 565, Advanced Conversation; six hours selected from literature courses. Highly recommended is FLL 464, Comparative Study of Modern Languages.

III. The professional education requirements for secondary school teaching, including ED 342. Strategies of Foreign Language Instruction in Secondary Schools.

IV. It is highly recommended that each student develop a sequence of courses leading to a teaching minor in a closely related subject.

Foreign Language Minor

Requirements: 12 hours beyond 204, including:

261 Composition	3 credits
365 Conversation	3
Two courses numbered 400 or higher.	6
	12 credits

Foreign Language Teaching Minor

Requirements: 18 hours beyond 204, including:

261 Composition	3
365 Conversation	3
465 Intermediate Conversation	3
450 Civilization (Spanish 451 or 550)	3
or	
552 Culture (or Span 413)	
Two courses numbered 400 or higher of which one must be in literature.	6
	18 credits

Also required is ED 342, Strategies of Foreign Language Instruction in Secondary School, or a comparable course. Highly recommended is FLL 464, Comparative Study of Modern Languages.

CLASSICS

CLCS 311. FIRST COURSE IN LATIN. Class 3, cr. 3.

This introduction to the Latin language is designed to give the student mastery over basic Latin grammar and vocabulary and to enable the student to read simple Latin prose passages. The course is intended to meet the needs of those students who have not yet begun their study of Latin but those with one year of high school preparation will be admitted to the class.

CLCS 321. GREEK AND LATIN ETYMOLOGY. Class 3, cr. 3.

This course is a study of common Latin and Greek roots and affixes in English words, with emphasis on the processes of translation, transliteration, and the development of word families.

CLCS 322. MYTHOLOGY. Class 3, cr. 3.

This course is a study of the development of Greek and Roman mythological systems with special attention to their use in literature. A comparison will be made with Germanic mythology.

CLCS 411. INTERMEDIATE LATIN. Class 3, cr. 3. Prerequisite: CLCS 311 or equivalent.

The first part of the semester is devoted to a review of the fundamentals of grammar through reading and analysis of relatively simple passages in prose. Other readings from Cicero, Livy and Tacitus will be used in the second half of the semester.

GENERAL LANGUAGE COURSES

FLL 010 ENGLISH AS A FOREIGN LANGUAGE I. Class 3, cr. 0. May not be counted toward graduation. Prerequisite: For foreign born whose native language is not English, or by permission of the Dean of HESS.

The presentation of the basic skills of the English language to foreign-language speaking students; grammar and phonology with language laboratory practice.

FLL 011. ENGLISH AS A FOREIGN LANGUAGE II. Class 3, cr. 0. May not be counted toward graduation. Prerequisite: FLL 010 or permission of the Dean of HESS.

A continuation of FLL 010 with freshman goals in English, such as English fluency and comprehension, sentence and paragraph writing. Language laboratory practice.

FLL 020. FOUNDATIONS OF FOREIGN LANGUAGE LEARNING. Class 3, cr. 0.

A presentation of the principles which function in the daily use of language, such as structure, relationships between sounds and meaning, form and function of words, syllables and stress. An examination of basic linguistic habits, dialectical differences and of levels of speech in any community. The classification of language elements. How we learn our own language and how we learn others.

FLL 464. COMPARATIVE STUDY OF MODERN LANGUAGES. Class 3, cr. 3. No prerequisite.

An examination of French, German and Spanish phonology, syntax and morphology. Representative presentations of historical and contemporary descriptive considerations of these languages.

FLL 490. SPECIAL TOPICS. Cr. 1-4.

An undergraduate course in special, individual assignments in literature or general linguistic topics related to French, German or Spanish; such topics are mutually chosen by student and professor. This course may be repeated once for credit, providing topics are different.

FRENCH

UNDERGRADUATE LEVEL

FR 101. FIRST COURSE IN FRENCH. Class 3, Lab. 1, cr. 3.

Introduction to the linguistic skills of French, based on a knowledge of language arts and intended to achieve an audio-lingual competence in French.

FR 102. SECOND COURSE IN FRENCH. Class 3, Lab 1, cr. 3. Prerequisite: FR 101.

Continuation of FR 101.

FR 203. THIRD COURSE IN FRENCH. Class 3, cr. 3. Prerequisite: FR 102 or equivalent.

A conversational approach to the culture of France with a review of French language skills as needed.

FR 204. FOURTH COURSE IN FRENCH. Class 3, cr. 3. Prerequisite: FR 203 or equivalent.

Continuation of FR 203 and the presentation of intellectual readings.

FR 230. MODERN FRENCH AUTHORS IN TRANSLATION. Class 3, cr. 3.

Reading and analysis of major French writers of the modern period with particular emphasis on the evolution of literary genres in relation to cultural, political, and social trends. Knowledge of French not required.

FR 261. FRENCH COMPOSITION. Class 3, cr. 3. Prerequisite: FR 203.

The essentials of French grammar as applied in composition. May be taken concurrently with FR 204.

FR 307. COMMERCIAL FRENCH. Class 3, cr. 3. Prerequisite: FR 204 or equivalent.

This course will provide students with the fundamentals of effective expression and communication as these apply to French business situations in particular. It will concentrate on commercial vocabulary, reading, writing and speaking as related to international business.

FR 308. LANGUAGE PRACTICUM IN BUSINESS. Cr. 3. Prerequisite: FR 307 or equivalent, and previous approval of the Department of Foreign Languages and Literatures. The course may be taken simultaneously with FR 365, 465 or 461. May be repeated once for credit if the field experience is different.

The course will consist of actual on-the-job experience in international corporations, industry, commerce or government where French is used. It is a course designed to expose language students to their chosen vocational field. Students can gain valuable on-the-job experience and academic credit all in one course. Students will practice the material covered in FR 307, business letters, terminology used for checks, telegrams, bills, banking transactions, credits, import-export, customs, insurance.

FR 365. FRENCH CONVERSATION. Class 3, cr. 3. Prerequisite: FR 204.

Intensive practice in French conversation. Pattern practice, preparation and delivery of dialogues and topical talks. Introduction to basic phonetics and practice in pronunciation.

FR 405. INTRODUCTION TO FRENCH LITERATURE I. Class 3, cr. 3. Prerequisite: FR 204.

Introduction to the periods of French literature from the beginning through the eighteenth century. Reading and discussion of representative works. The rudiments of literary criticism.

FR 406. INTRODUCTION TO FRENCH LITERATURE II. Class 3, cr. 3. Prerequisite: FR 204.

Introduction to the periods of French literature from the late eighteenth century to the present time. Reading and discussion of representative works. The rudiments of literary criticism.

FR 450. FRENCH CIVILIZATION. Class 3, cr. 3.

The study of modern French life with emphasis on the customs and daily life of the people. Lectures in the language.

FR 461. INTERMEDIATE FRENCH COMPOSITION. Class 3, cr. 3. Prerequisite: FR 261.

A continuation of FR 261. In this course, stress is given to the development of more complex grammar and its application in the written language. Emphasis is placed on the structure of composition and basic refinement and precision brought about by grammar and vocabulary.

FR 465. INTERMEDIATE FRENCH CONVERSATION. Class 3, cr. 3. Prerequisite: FR 365.

Continued and more advanced practice in French conversation and study of phonetics for accuracy in pronunciation and intonation. Students are encouraged to study contemporary French culture as a basis for their conversations.

DUAL LEVEL
Undergraduate-Graduate

FR. 510. THE CLASSICAL AGE. Class 3, cr. 3. Prerequisite: FR 405.

The social background and the formation of classical traits of seventeenth century in France. Readings from Corneille, Racine, Moliere and minor authors.

FR 530. CONTEMPORARY FRENCH NOVEL. Class 3, cr. 3. Prerequisite: FR 406.

Contemporary novel as an insight into twentieth century French life. Analysis of works by selected authors.

FR 532. CONTEMPORARY FRENCH THEATRE. Class 3, cr. 3. Prerequisite: FR 406.

Readings and discussion of works in the twentieth-century theatre. Cocteau, Giraudoux, Montherlant, Claudel, Sartre, Camus, Anouilh, Ionesco, Beckett, Genet.

FR 552. FRENCH CULTURE. Class 3, cr. 3.

Development of the cultural life of the French people as reflected in architecture, art, history, literature, music, and philosophy. Lectures in French.

FR 562. ADVANCED FRENCH COMPOSITION. Class 3, cr. 3. Prerequisite: FR 261 or consent of instructor.

Additional training in writing French.

FR 565. ADVANCED FRENCH CONVERSATION. Class 3, cr. 3. Prerequisite: FR 465.

Additional practice in speaking and understanding French. Talks based on material given in class.

FR 590. DIRECTED READING IN FRENCH. Cr. 1-4. Prerequisite: consent of head of department. (May be repeated for credit.)

GERMAN

UNDERGRADUATE LEVEL

GER 101. FIRST COURSE IN GERMAN. Class 3, Lab. 1, cr. 3.

Introduction to the linguistic skills of German, based on a knowledge of language arts and intended to achieve an audio-lingual competence in German.

GER 102. SECOND COURSE IN GERMAN. Class 3, Lab. 1, cr. 3. Prerequisite: GER 101.

Continuation of GER 101.

GER 203. THIRD COURSE IN GERMAN. Class 3, cr. 3. Prerequisite: GER 102 or equivalent.

A conversational approach to the culture of Germany with a review of German language skills as needed.

GER 204. FOURTH COURSE IN GERMAN. Class 3, cr. 3. Prerequisite: GER 203 or equivalent.

A continuation of GER 203 and the presentation of intellectual readings.

GER 230. GERMAN LITERATURE IN TRANSLATION. Class 3, cr. 3.

Reading and analysis of selected German writers and their works with particular emphasis on the social, political, and intellectual climate of the times. The course content will change from semester to semester. Knowledge of German not required.

GER 244. FOURTH COURSE IN SCIENTIFIC GERMAN. Class 3, cr. 3. Prerequisite: GER 203. Credit will not be given for both GER 204 and 244.

GER 261. GERMAN COMPOSITION. Class 3, cr. 3. Prerequisite: GER 203.

The essentials of German grammar as applied in composition. May be taken concurrently with GER 204.

GER 307. COMMERCIAL GERMAN. Class 3, cr. 3. Prerequisite: GER 204 or equivalent.

This course will provide students with the fundamentals of effective expression and communication as these apply to German business situations in particular. It will concentrate on commercial vocabulary, reading, writing, and speaking as related to international business.

GER 308. LANGUAGE PRACTICUM IN BUSINESS. Cr. 3. Prerequisite: GER 307 or equivalent, and previous approval of the Department of Foreign Languages and Literatures. The course may be taken simultaneously with GER 365, 465 or 461. May be repeated once for credit if the field experience is different.

The course will consist of actual on-the-job experience in international corporations, industry, commerce or government where German is used. It is a course designed to expose language students to their chosen vocational field. Students can gain valuable on-the-job experience and academic credit all in one course. Students will practice the material covered in GER 307, business letters, terminology used for checks, telegrams, bills, banking transactions, credits, import-export, customs, insurance.

GER 365. GERMAN CONVERSATION. Class 3, cr. 3. Prerequisite: GER 204.

Intensive practice in German conversation. Pattern practice, preparation and delivery of dialogues and topical talks. Introduction to basic phonetics and practice in pronunciation.

GER 405. INTRODUCTION TO GERMAN LITERATURE I. Class 3, cr. 3. Prerequisite: GER 204.

Survey of German literature from the beginning through the eighteenth century. Reading and discussion of representative works and the fundamentals of literary criticism.

GER 406. INTRODUCTION TO GERMAN LITERATURE II. Class 3, cr. 3. Prerequisite: GER 405.

A continuation of GER 405 covering the basic German literature survey from the eighteenth century to the present time.

GER 450. GERMAN CIVILIZATION. Class 3, cr. 3.

The study of modern German life with emphasis on the customs and daily life of the people. Lectures in the language.

GER 461. INTERMEDIATE GERMAN COMPOSITION. Class 3, cr. 3. Prerequisite: GER 261.

A continuation of GER 261. In this course, stress is given to the development of more complex grammar and its application in the written language. Emphasis is placed on the structure of composition and basic refinement and precision brought about by grammar and vocabulary.

GER 465. INTERMEDIATE GERMAN CONVERSATION. Class 3, cr. 3. Prerequisite: GER 365.

Continued and more advanced practice in German conversation and the study of phonetics for accuracy in pronunciation and intonation. Students are encouraged to study contemporary German culture as a basis for their conversations.

DUAL LEVEL
Undergraduate-Graduate

GER 515. THE AGE OF ENLIGHTENMENT AND THE STORM AND STRESS MOVEMENT. Class 3, cr. 3. Prerequisite: GER 405.

A study of the literature of the Age of Englightenment, the cult of feeling and the Storm and Stress works of Goethe and Schiller.

GER 519. GERMAN CLASSICISM. Class 3, cr. 3. Prerequisite: GER 406.

The study of the classical period in German literature as revealed in the works of Goethe and Schiller.

GER 520. GERMAN ROMANTICISM. Class 3, cr. 3. Prerequisite: GER 406.

A study of the rise and degeneration of the Romantic ideal in German literature. Particular attention is paid to the aesthetics, literary criticism, and the revival of a national heritage.

GER 522. GERMAN DRAMA FROM THE BEGINNING OF THE NINETHEENTH CENTURY TO NATURALISM. Class 3, cr. 3. Prerequisite: GER 406.

A study of the most significant dramatists until the advent of naturalism.

GER 523. THE GERMAN NOVELLE. Class 3, cr. 3. Prerequisite: GER 406.

A survey of the development of the *Novelle*, a literary genre which presents Germany's unique contribution to the European literature of the nineteenth century.

GER 530. GERMAN PROSE FROM NATURALISM TO THE PRESENT. Class 3, cr. 3. Prerequisite: GER 406.

Development of the novel and short story of the period, with special emphasis on the major authors.

GER 532. GERMAN DRAMA FROM NATURALISM TO THE PRESENT. Class 3, cr. 3. Prerequisite: GER 406.

Development of the drama through the various literary movements of the period, including consideration of the underlying social and ideological forces.

GER 552. GERMAN CULTURE. Class 3, cr. 3.

The development of the cultural life in German-speaking lands as reflected in architecture, art, history, literature, music, and philosophy. Lectures in German.

GER 562. ADVANCED GERMAN COMPOSITION. Class 3, cr. 3. Prerequisite: GER 261 or consent of instructor.

Additional training in writing German.

GER 565. ADVANCED GERMAN CONVERSATION. Class 3, cr. 3. Prerequisite: GER 465.

Additional practice in speaking and understanding German. Talks based on material given in class.

GER 590. DIRECTED READING IN GERMAN. Cr. 1-4. Prerequisite: consent of head of department. (May be repeated for credit.)

SPANISH

UNDERGRADUATE LEVEL

SPAN 101. FIRST COURSE IN SPANISH. Class 3, Lab. 1, cr. 3.

Introduction to the linguistic skills of Spanish, based on a knowledge of language arts and intended to achieve an audio-lingual competence in Spanish.

SPAN 102. SECOND COURSE IN SPANISH. Class 3, Lab. 1, cr. 3. Prerequisite: SPAN 101.

Continuation of SPAN 101.

SPAN 203. THIRD COURSE IN SPANISH. Class 3, cr. 3. Prerequisite: SPAN 102 or equivalent.

A conversational approach to the cultures of Spain and South America with a review of Spanish language skills as needed.

SPAN 204. FOURTH COURSE IN SPANISH. Class 3, cr. 3. Prerequisite: SPAN 203 or equivalent.

A continuation of SPAN 203 and the presentation of intellectual readings.

SPAN 230. CONTEMPORARY SPANISH AMERICAN LITERATURE IN TRANSLATION. Class 3, cr. 3.

Reading and discussion of selected masterpieces of twentieth century Latin American prose fiction and essays in translation. Emphasis on works written after World War II. Knowledge of Spanish not required.

SPAN 261. SPANISH COMPOSITION. Class 3, cr. 3. Prerequisite: SPAN 203.

The essentials of Spanish grammar as applied in composition. May be taken concurrently with SPAN 204.

SPAN 307. COMMERCIAL SPANISH. Class 3, cr. 3. Prerequisite: SPAN 204 or equivalent.

This course will provide students with the fundamentals of effective expression and communication as these apply to Spanish business situations in particular. It will concentrate on commercial vocabulary, reading, writing and speaking as related to international business.

SPAN 308. LANGUAGE PRACTICUM IN BUSINESS. Cr. 3. Prerequisite: SPAN 307 or equivalent, and previous approval of the Department of Foreign Languages and Literatures. The course may be taken simultaneously with SPAN 365, 465 or 461. May be repeated once for credit if the field experience is different.

The course will consist of actual on-the-job experience in international corporations, industry, commerce or government where Spanish is used. It is a course designed to expose language students to their chosen vocational field. Students can gain valuable on-the-job experience and academic credit all in one course. Students will practice the material covered in SPAN 307, business letters, terminology used for checks, telegrams, bills, banking transactions, credits, import-export, customs, insurance.

SPAN 313. SPANISH FOR SPANISH SPEAKERS I. Class 3, cr. 3. Prerequisite: native speaking ability in Spanish as determined by placement test; not open to students who have had SPAN 365 and SPAN 261.

The presentation of the structure and phonology of Spanish in Spanish for those who come from native-speaking backgrounds but who require the formal training. Grammar, composition, and standard Spanish fluency.

SPAN 314. SPANISH FOR SPANISH SPEAKERS II. Class 3, cr. 3. Prerequisite: SPAN 313 or native speaking ability in Spanish and consent of the department head.

A continuation of SPAN 313 with the presentation of levels of Spanish speech, intellectual readings and compositions, grammar problems.

SPAN 365. SPANISH CONVERSATION. Class 3, cr. 3. Prerequisite: SPAN 204.

Intensive practice in Spanish conversation. Pattern practice, preparation and delivery of dialogues and topical talks. Introduction to basic phonetics and practice in pronunciation.

SPAN 405. INTRODUCTION TO SPANISH LITERATURE I. Class 3, cr. 3. Prerequisite: SPAN 204.

Introduction to the periods in Spanish literature from the beginning to the eighteenth century. Reading and discussion of representative works. The rudiments of literary criticism.

SPAN 406. INTRODUCTION TO SPANISH LITERATURE II. Class 3, cr. 3. Prerequisite: SPAN 204.

Introduction to the periods in Spanish literature from the eighteenth century to the present. Reading and discussion of representative works. The rudiments of literary criticism.

SPAN 413. CULTURE OF SPANISH-SPEAKING AMERICANS. Class 3, cr. 3. No prerequisite.

An introduction to the cultural heritage and customs of groups of Spanish-speaking Americans, such as Mexican-Americans, Puerto-Rican Americans, Cuban Americans. The nature of the social processes, points of interference between cultures. Historical and geographical perspectives of Spanish-speaking Americans.

SPAN 414. LITERATURE OF SPANISH-SPEAKING AMERICANS. Class 3, cr. 3. No prerequisite.

The study of the literature of Chicano and Puerto Rican authors. Poetry, plays, short stories and novels presented in survey form so as to cover fairly themes from each Spanish-speaking population segment in contemporary American life. Intermediate knowledge of Spanish is needed because of dialecticisms in many of the contemporary works.

SPAN 435. SPANISH AMERICAN LITERATURE TO MODERNISM. Class 3, cr. 3. Prerequisite: SPAN 204.

The study of the development of Spanish American literature from the early chronicles to the end of the nineteenth century with consideration of the pre-hispanic background.

SPAN 436. SPANISH AMERICAN LITERATURE FROM MODERNISM TO PRESENT. Class 3, cr. 3. Prerequisite: SPAN 204.

A continuation of SPAN 435. The study of the development of Spanish American literature beginning with the Modernist period to the present.

SPAN 451. SPANISH CIVILIZATION. Class 3, cr. 3.

The study of modern Spanish life with regard to the social institutions and customs. Lectures in the language.

SPAN 461. INTERMEDIATE SPANISH COMPOSITION. Class 3, cr. 3. Prerequisite: SPAN 261.

A continuation of SPAN 261. In this course, stress is given to the development of more complex grammar and its application in the written language. Emphasis is placed on the structure of composition and basic refinement and precision brought about by grammar and vocabulary.

SPAN 465. INTERMEDIATE SPANISH CONVERSATION. Class 3, cr. 3. Prerequisite: SPAN 365.

Continued and more advanced practice in Spanish conversation and the study of phonetics for accuracy in pronunciation and intonation. Students are encouraged to study contemporary culture as a basis for their conversations.

DUAL LEVEL
Undergraduate-Graduate

SPAN 506. EARLY SPANISH PROSE: ORIGINS TO THE LAZARILLO. Class 3, cr. 3. Must be preceded by SPAN 405.

Spanish prose, principally the narrative, from the thireenth century to the middle of the sixteenth. Reading and discussion of representative works from the beginnings of Castilian prose up to *Lazarillo de Tormes*.

SPAN 520. THE SPANISH NOVEL FROM REGIONALISM THROUGH THE GENERATION OF '98. Class 3, cr. 3. Prerequisite: SPAN 406.

The study of the nineteenth-century novel from the *costumbristas* to Galdos. The social and aesthetic preoccupations of the Generation of '98. Lectures and readings from representative authors.

SPAN 530. CONTEMPORARY SPANISH NOVEL. Class 3, cr. 3. Prerequisite: SPAN 406.

The contemporary novel as an insight into twentieth century Spanish life and thought. Analysis of selected authors.

SPAN 534. SPANISH AMERICAN NOVEL SINCE 1940. Class 3, cr. 3.

A study of the newly evolved forms in the novel from the fourth decade of the twentieth century in which we witness the birth of the new novel to the new experiments with the antinovel.

SPAN 550. LATIN AMERICAN CIVILIZATION. Class 3, cr. 3.

Outline of Latin American history; the cultural heritage from Spain and from the pre-Spanish civilizations; the intellectual, social, and.cultural progress of the Latin American countries. Lectures in the language.

SPAN 552. SPANISH CULTURE. Class 3, cr. 3.

The development of the cultural life of the Spanish people, as reflected in the geography, history, music, art, and architecture of Spain. Lectures in Spanish.

SPAN 562. ADVANCED SPANISH COMPOSITION. Class 3, cr. 3. Prerequisite: SPAN 261 or consent of instructor.

Additional training in writing Spanish.

SPAN 564. INTRODUCTION TO THE LINGUISTIC STUDY OF SPANISH. Class 3, cr. 3. Must be preceded by SPAN 365 and 261, or equivalent preparation.

Principles of phonetics, phonemics, and syntax as applied to Spanish. Brief introduction to general and historical linguistics.

SPAN 565. ADVANCED SPANISH CONVERSATION. Class 3, cr. 3. Prerequisite: SPAN 365.

Additional practice in speaking and understanding Spanish. Talks based on material given in class.

SPAN 590. DIRECTED READING IN SPANISH. Cr. 1-4. Prerequisite: consent of head of department. (May be repeated for credit.)

DEPARTMENT OF HISTORY AND POLITICAL SCIENCE

S. Lerner, Head

FACULTY: E. G. De Felice, M. W. H. Grote, E. P. Keleher, S. Lerner, H. J. Merry (Emeritus), D. F. Pierce, J. W. Pringle, A. D. Sander, N. L. Trusty, R. A. Van Orman

The Department of History and Political Science offers a wide range of courses in History and Political Science leading to baccalaureate degrees in American History, European History, Political Science, and Social Studies Teaching. The Department also offers complete Master of Arts Degrees in American and European History and graduate-level courses in Political Science.

The respective objectives of bachelor of arts degrees in History and Political Science differ.

History is the study of the past. The multiplicity of events and the multidimensional richness of the past are the substance of history. Included within its scope are political, social, religious, diplomatic, intellectual, scientific, economic and ethnic studies which are represented in the courses offered at this campus. The History program attempts to impart (1) an understanding of past institutions, traditions, events and individuals; (2) a comprehension of research and writing skills; (3) a grasp of methods of critical analysis of evidence; (4) the perspectives with which to understand the events of our own times; and (5) intellectual integrity and a commitment to truth. Such skills prepare students for careers in law, government, teaching and business.

Political science is the systematic study of politics, one of the most important elements of our social existence. The department's program is designed to provide an understanding of the rights and obligations of the citizen, a knowledge of the functioning and role of government, and a purposeful general preparation for the entry into any of the professions, especially law, teaching and business. Undergraduates majoring in political science are enabled to secure a more comprehensive background for public affairs and public service and some specialized training in any of the major areas of the discipline.

Career Opportunities

Training in history or political science equips persons for many types of careers both in and outside these fields. Emphasis upon breadth of viewpoint, conscientiousness in research, the examination of all pertinent evidence, and clarity of writing and thinking are qualities needed in many occupations. The Baccalaureate Degree in History or Political Science is required for pursuit of graduate programs in those fields leading to teaching at the collegiate level. The Social Studies Teaching Major is specifically designed for those who wish to teach in the secondary schools. History and Political Science Majors provide excellent training for legal careers. These Majors also furnish excellent preparation for persons seeking positions in journalism, with local, state, or federal governmental agencies, corporations, publishing houses, or in other occupations requiring a liberal arts background. The Department of History and Political Science provides career information and the Placement Office of Purdue University Calumet offers assistance in securing positions.

DEPARTMENTAL MAJORS:

American History Major

The American History Major consists of 33 credit hours of various history courses and is designed to provide broad familiarity with American and European History as well as depth in specialized fields of American History. No minor is required. Prerequisites to the major are History 151 — **American History to 1877** and History 152

— **U.S. History since 1877.** The major consists of History 104 — **Modern Civilization,** History 582 — **The Art of History,** one three-hour course in 100 or 200-level non-U.S. history, two three-hour courses in 300, 400, or 500-level non-U.S. history, and six 300, 400, or 500-level courses in U.S. History (at least one period course and at least one topical course).

European History Major

The European History Major consists of 33 credit hours of various history courses and is designed to provide broad familiarity with European and American history as well as depth in specialized fields of European History. No minor is required. Prerequisites to the major are two courses selected from among History 102 — **Ancient World** History 103 — **Medieval World,** and History 104 — **Modern Civilization.** The major consists of History 582 — **The Art of History,** two three-hour courses in 100 or 200-level U.S. or Latin American history courses, two three-hour 300, 400, or 500-level courses in non-European history, and six 300, 400, or 500-level courses in European history (at least one period course and at least one topical or national course).

Political Science Major

The Political Science Major consists of 33 credit hours of various courses in political science. The major is designed to provide broad familiarity with five areas of political science and to afford some specialization. No minor is required. The major consists of three requirements: (1) The introductory course in each of five areas of political science (the five areas are I — American Political Systems, Processes, and Institutions; II — Comparative Political Systems, Behavior, and Ideologies; III — International Relations; IV — Political Theory, Analysis, and Behavior; and V — Public Policy, Processes and Change); (2) At least one additional course in areas I, III, and IV; and (3) a minimum of 18 hours of the 33 required for the major must be above the 299 course level.

Social Studies Teaching Major

The State of Indiana mandates that the Social Studies Teaching Major consist of one primary teaching area of eighteen semester hours and two 12-hour supporting areas selected from among the following disciplines: anthropology, economics, geography, government, psychology, sociology, United States History and World Civilization. The major also requires ten semester hours in social studies courses not taken from the candidate's primary or supporting areas. Appropriate courses have been provided to fulfill the requirements of the Social Studies Teaching Major.

Pre-Law Major

A Pre-Law Major consists of any approved undergraduate major plus those electives that will prepare students to pass the Law School Admission Test (LSAT), which is required for admission to most Law Schools. According to the LSAT Bulletin, "clear and systematic thinking, command of the English language and a broad understanding of our society" are needed to pass the LSAT. The LSAT measures the students "ability to understand and reason with verbal, quantitative and symbolic materials." Majors in History and Political Science are particularly helpful in providing the background needed for success in the LSAT and admission to Law Schools.

HISTORY

UNDERGRADUATE LEVEL

HIST 100. THE MODERN WORLD I. Class 3, cr. 3. Not open to HESS students.

A survey of the history of the modern world from the 16th century to the 1870's.

HIST 101. THE MODERN WORLD II. Class 3, cr. 3. Not open to HESS students.

A survey of the history of the modern world from the 1870's to the present.

HIST 102. INTRODUCTION TO THE ANCIENT WORLD. Class 3, cr. 3.

A survey of the history of the ancient world (ancient Near East, Greece, and Rome) from its origins in the immediate prehistoric period to its dismemberment in the early Christian era. Emphasis is placed upon the cultural contributions of the various peoples whose interaction laid the foundation for modern, western civilization. Designed to meet the needs of the beginning student of European and world history.

HIST 103. INTRODUCTION TO THE MEDIEVAL WORLD. Class 3, cr. 3.

A survey of European History from the disintegration of the western Roman Empire through the age of expansion and discovery in the sixteenth century. Major emphasis is placed on those institutions and habits of thought peculiar to western Europe in the medieval era including feudal relations. Benedictine monasticism, the Papacy, the German Empire, and scholastic theology. Relevant contemporary developments in the Byzantine and Islamic worlds, however, are also studied. Designed to meet the needs of the beginning student in European history.

HIST 104. INTRODUCTION TO THE MODERN WORLD. Class 3, cr. 3.

Traces the expansion of Europe into the Americas, Africa, and Asia. The French Revolution, nationalism, and the development of western European states from the era of the Reformation to the present are studied.

HIST 151. AMERICAN HISTORY TO 1877. Class 3, cr. 3.

A study of the development of American political, economic, and social institutions from the early explorations and Colonial settlements through Reconstruction.

HIST 152. UNITED STATES SINCE 1877. Class 3, cr. 3.

A study of the growth of the United States from 1877 to the present. The new industrialism, agrarian problems, depression, the New Deal, the two world wars, the cold war, and similar topics are analyzed.

HIST 245. ISLAMIC CIVILIZATION: A HISTORICAL AND CULTURAL SURVEY. Class 3, cr. 3.

A survey of the civilization of the Middle East from the rise of Islam to the present. The political, social, and cultural institutions are examined along with the problem of adjusting these to the pressure of western civilization in the last two centuries.

HIST 271. LATIN AMERICAN HISTORY TO 1824. Class 3, cr. 3.

A survey of Latin American history from its origins to the end of the major movements to independence, with emphasis on discovery, colonization, expansion, and the transfer of institutions from Spain and Portugal.

HIST 272. LATIN AMERICAN HISTORY FROM 1824. Class 3, cr. 3.

A survey of Latin American History from independence to the present with particular attention to political, economic, and social problems connected with modernization.

HIST 328. ENGLISH HISTORY TO 1688. Class 3, cr. 3.

This course is designed to survey the growth and development of English society from its beginning through the seventeenth century. Emphasis is put upon those institutions and events that influenced the establishments of the English legal system.

HIST 329. ENGLISH HISTORY SINCE 1688. Class 3, cr. 3.

A continuation of HIST 328. Emphasis is placed upon Great Britain as a world and imperial power. Attention is given particularly to the industrial revolution, the growth and achievements of democratic institutions, and the role Britain has played in western civilization in recent times.

HIST 334. SCIENCE AND TECHNOLOGY IN WESTERN CIVILIZATION II. Class 3, cr. 3.

A survey of some of the main features of the historical development of science and technology in the western world from Newton to the present. Emphasis is placed upon the relation between the achievements of individual investigators and the major aspects of the society and culture in which they lived.

HIST 365. WOMEN IN AMERICA. Class 3, cr. 3.

A survey of the history of women in America from Colonial times to the present. Emphasis is on changing status of women, social and cultural influences, movements for women's rights and women's contributions to American society.

HIST 397. THE AFRO-AMERICAN. Class 3, cr. 3.

A survey of the history of the Afro-Americans in the United States from their African background to the present. Emphasis is placed upon the changing economic, social, and political status of Afro-Americans in the United States, and upon their contributions to American society.

(General prerequisite for all history courses

numbered from 400 to 499: sophomore standing or consent of instructor.)

HIST 461. THE REVOLUTIONARY ERA, 1763 to 1800. Class 3, cr. 3.

An analysis of the origins, nature, and consequences of the American Revolution; of the achievements and difficulties of the new nation under the Articles of Confederation; of the drafting and adoption of the Constitution; and the initial political, economic, and social progress of the United States under the Federalists.

HIST 490. TOPICS IN AMERICAN HISTORY. Class 3, cr. 3. Variable title. Sophomore standing and the appropriate history survey course (HIST 151 or HIST 152). May be repeated for credit.

HIST 491. TOPICS IN EUROPEAN HISTORY. Class 3, cr. 3. Variable title. Sophomore standing and the appropriate history survey course (HIST 102, HIST 103 or HIST 104). May be repeated for credit.

DUAL LEVEL
Undergraduate-Graduate

(General prerequisite for all history courses numbered from 500 to 599: junior standing or consent of instructor.)

HIST 510. THE AGE OF ABSOLUTE MONARCHY, 1600-1789. Class 3, cr. 3.

The Age of Absolute Monarchy, the first in a four-course sequence dealing with Modern Europe, will study that epoch, which can be identified as a transitional unit between the Reformation and the great revolutionary upheavals of the late eighteenth century. The major theme of the period 1600-1789 is the struggle between the dynastic establishment and those forces which sought to alter and eventually overthrow it. The course will also explore the decline of the Holy Roman Empire, Sweden, Poland, and the Ottoman Empire, and analyze those factors which contributed to the rise of Austria, Prussia, and Russia. Considerable attention will be devoted to the nature of enlightened despotism in these states and to the impact which enlightened thought had on the Old Regime in France. This course, and the others in the sequence, will enable the student to appreciate the panorama of ideas, events, and personalities which contributed a rich intellectual and political heritage to western civilization.

HIST 511. ENGLAND UNDER THE TUDORS. Class 3, cr. 3.

A study in depth of English society, 1485 to 1603. Special consideration is given to the "Tudor revolution in government," the English Reformation, the growth of Parliament, and the social and economic problems which beset England during the era of European expansion into the New World.

HIST 512. ENGLAND UNDER THE STUARTS. Class 3, cr. 3.

An intensive study of England during the period 1603 to 1689. The course begins by analyzing the political, economic, and religious tensions in English society under James I, and their aggravation during the reign of his son Charles I. The major focus of the course is the period 1640 to 1660: the Puritan Revolution, the Commonwealth, and the Protectorate of Oliver Cromwell. Lectures and readings analyze the causes of the revolution, the parties involved and their conflicting aims, the ferment of ideas (as seen in the works of men like Harrington, Hobbes, and Milton), and the problem of the degree to which the revolution was indeed revolutionary. The course concludes with a study of the Restoration, and of the Glorious Revolution of 1688-89: the denouement of this period of turmoil.

HIST 513. MODERN EUROPE, 1789-1850. Class 3, cr. 3.

This course, the second of a four-course sequence on the history of modern Europe, will focus on the major themes of the era 1789-1850: the French Revolution, the ascendancy of France in Europe, and the reaction to that hegemony; the beginning of machine industry, and the social, political, and ideological consequences; the widespread revolutions of 1848. The careers of outstanding and influential individuals, as well as social movements and their interaction with those individuals, will be examined. Attention will also be paid to the continuity of historical development in relating these themes to earlier stages in the growth of European civilization.

HIST 521. PROBLEMS IN HISTORY OF GREAT BRITAIN, NINETEENTH CENTURY. Class 3, cr. 3.

An intensive study of problems in the social, economic, political, and cultural growth of the peoples of Great Britain.

HIST 522. PROBLEMS IN HISTORY OF GREAT BRITAIN, TWENTIETH CENTURY. Class 3, cr. 3.

A review and evaluation of the social, political, economic, and military changes in the domestic and foreign history of Great Britain from 1901 to the present.

HIST 525. PROBLEMS IN TWENTIETH-CENTURY GERMAN HISTORY. Class 3, cr. 3.

A study in depth of three major periods of German history in this century: pre-1914, the Weimar Republic, and the Third Reich. Emphasis is placed on the transformation which occurred in German society as a result of the upheavals of this century.

HIST 529. EUROPEAN INTERNATIONAL RELATIONS AND POWER POLITICS SINCE 1815. Class 3, cr. 3.

Continuation of HIST 528. Emphasis is upon the impact of ideological factors in European power politics in the 19th and 20th centuries.

HIST 535. MODERN EUROPE, 1850-1914. Class 3, cr. 3.

This course is the third segment of the sequence on the history of modern Europe. The period to be covered in this course are those years which are regarded as the zenith of European civilization: 1850-1914. The structure is both chronological and topical. In addition to an examination of the political development of the European states, specific topics such as science and the arts, industrialization, the major idealogies and social movements, imperialism, and international diplomacy will be discussed.

HIST 538. SOCIAL AND CULTURAL HISTORY OF MODERN RUSSIA. Class 3, cr. 3.

A survey of family policies, education, the relationship of ethnic minorities to the state, the role and status of artists, and questions of social stratification in the Soviet Union since 1917.

HIST 552. EUROPE SINCE 1914. Class 3, cr. 3.

This course will concentrate on political, social, economic, and intellectual legacies of the two world wars. Special emphasis will be placed upon the structure of peace and security after 1919 and the dictatorships, Bolshevik Russia, Facist Italy, and Nazi Germany. Another object of the course will be to show how the break-up of the Hapsburg monarchy led to the creation of a power vacuum in Eastern Central Europe which Nazi and Soviet imperialism filled in succession during the critical period 1938-1948, thereby terminating Western influence in that part of the Continent. After examinining the Cold War and the revolts against Soviet rule in Hungary and Czechoslovakia, the course will conclude with an assessment of the present status of East-West relations.

HIST 553. COLONIAL AMERICA, 1600-1776. Class 3, cr. 3.

A study of the expansion of Europe, the age of exploration and discovery, and the establishment of colonies in the New World. Particular attention will be paid to the emergence of an American culture during the seventeenth and eighteenth centuries, the nature of the British Empire, and the emergence of dissent and revolution. This course is the first part of a five part upper-level overview of American history.

HIST 554. THE ERA OF SECTIONALISM, 1820-1865. Class 3, cr. 3.

Third in a five-part overview of American history, this course will concentrate on the rise to domination of those forces and factors that led to a disastrous Civil War: slavery and antislavery, economic jostling among the sections, expansionism, the creation of false sectional stereotypes, and the rise of hostile sectional parties. The Civl War will be analyzed in military and political terms.

HIST 555. THE EMERGENCE OF MODERN AMERICA, 1865-1916. Class 3, cr. 3.

An examination of the nation that emerged emotionally exhausted from a civil war to become, by the eve of World War I, a land seemingly destined to achieve a degree of perfection not previously attained by the human community. The interaction of a flourishing industrial establishment, floods of immigrants, rapid urbanization, and smoldering racism combined to transform ante bellum America into a complex and relatively sophisticated society during those years. Emphasis will be placed upon an analysis of these forces and the men who tried to control them.

HIST 562. ENVIRONMENTALISM IN UNITED STATES HISTORY. Class 3, cr. 3.

A survey of the differing perspectives, attitudes, and values with which Americans have perceived and acted toward, upon, and within their physical environment from the late 18th century to the present.

HIST 564. MODERN AMERICA, 1917-PRESENT. Class 3, cr. 3.

A history of the United States from the First World War to the present; the political, social, economic, diplomatic, and intellectual developments in America during those years will be examined in their world context.

HIST 569. HISTORY OF THE AMERICAN SOUTH. Class 3, cr. 3.

This course will stress those political and social traits that make the region between the Potomac and Rio Grande rivers a cultural province conscious of its identity. After the American Revolution there developed differences between the North and South so sharp as to constitute a Southern Way of Life and a Northern Way of Life. In offering this regional course it will be necessary to focus on those differences which made the South a unique region and the interrelations between the South and the nation of which it was a part. Half of the course will deal with the major events in the South's history after the Civil War, especially dealing with industry, agriculture, and the rise and fall of Jim Crow.

HIST 575. THE AMERICAN FRONTIER. Class 3, cr. 3.

This course will involve study of the nature and importance of the westward movement in American history from the Revolution to the twentieth century. The westward movement will be treated in its varied aspects. Emphasis will be placed upon social and economic aspects as well as upon the spread of government. Efforts will be made to view this national expansion from the viewpoint of Americans exploiting a great land, offering vast resources, and the effects these resources had upon American development. Although the Turner thesis will be discussed, no attempt will be made to pursue a thesis.

HIST 582. THE ART OF HISTORY. Class 3, cr. 3.

This course or its equivalent is required of undergraduate history majors and master's candidates at the Calumet Campus.

A balanced presentation of the art of studying, understanding, researching, and writing history. Taught by the section, it will present a balanced view of problems in American and European historiography; casualty and methodology will be emphasized. Careful attention will be paid to research methods, the mechanics of citation, the use of the University library, and writing style.

HIST 584. SOCIAL HISTORY OF THE UNITED STATES. Class 3, cr. 3.

Social and cultural development of the American people since the late eighteenth century.

HIST 585. AMERICAN LABOR HISTORY. Class 3, cr. 3.

A chronological survey of American working class society, the growth of worker organizations, and the movement toward massive labor organization as a distinctive national development. Changing philosophies are examined, and the resulting pattern of relationship between management, the federal government, and the labor movement is emphasized.

HIST 586. UNITED STATES FOREIGN AFFAIRS TO 1900. Class 3, cr. 3.

An examination of United States relationships with the rest of the world from the colonial period to the end of the nineteenth century, viewed in perspectives of national development and international politics. Changes in policy and its ideological expression are analyzed, reflecting the drive for territorial expansion, the shifting focus of domestic political concerns, and the altered power position of the United States by the beginning of the twentieth century.

HIST 587. TWENTIETH-CENTURY UNITED STATES FOREIGN AFFAIRS. Class 3, cr. 3.

The course of the foreign policy followed by the United States as a great power is charted from the demand for expansion at the turn of the century to the demand for a reduction of commitments today. Analysis is focused upon the interaction of traditional American ideals, changing national interests, and unprecedented developments on the international scene that have produced the fluctuating goals and uneven success characterizing American's foreign affairs during the period of her greatest power.

HIST 589. HISTORY OF RELIGION IN AMERICA. Class 3, cr. 3.

A historical examination, from colonial beginnings to the present, of American religions and their role in the social, political, and economic life of the nation, including a survey of the speculative theories, the institutional forms, and the artistic and emotional expressions of religion which have developed in the United States.

HIST 590. DIRECTED READING IN HISTORY. Cr. 1-3. (May be repeated for credit.)

A reading course directed by the instructor in whose particular field of specialization the content of the reading falls. Approval of each reading project must be secured from the department.

HIST 592. EARLY AMERICAN INTELLECTUAL HISTORY. Class 3, cr. 3.

A survey of American political, economic, philosophical, and religious thought beginning with the European backgrounds of American Puritanism and concluding with the rise of Darwinian naturalism.

HIST 593. TWENTIETH-CENTURY AMERICAN INTELLECTUAL HISTORY. Class 3, cr. 3.

Origins and developments of modern American thought. Early American religious and philosophical traditions, Darwinian evolution and evolutionary naturalism, pragmatism; and the main currents of the 1920s and 1930s.

HIST 596. THE AMERICAN CITY. Class 3, cr. 3.

A survey of urban development in the United States from the early Colonial towns to the twentieth-century megalopolis. Emphasis is placed on the city as a particular geographic, economic, political, social, and cultural entity, and on its expanding role in American life.

HIST 599. TEACHING BLACK HISTORY IN THE SCHOOLS. Class 3, cr. 3.

An overview of the major forces and events that have shaped the lives of Black Americans, closely integrated with a detailed analysis of important teaching methods, approaches, and audio-visual aids, this course is aimed at teachers and prospective teachers. Its goals are two: to re-educate the teacher of American history toward a more balanced outlook, and to acquaint teachers of Black history with pivotal facts and interpretations of the American Black experience.

GRADUATE LEVEL

HIST 601. READING SEMINAR IN EUROPEAN HISTORY. Cr. 1-3. Graduate standing. May be repeated for credit.

Bibliography and historiography of selected fields of topics in European history; may vary in subject matter from semester to semester.

HIST 603. SEMINAR IN EUROPEAN HISTORY: RENAISSANCE AND REFORMATION. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study directed toward topics of particular interest in the history of a European nation or region during the period of the Renaissance and Reformation.

HIST 605. SEMINAR IN EUROPEAN HISTORY: THE AGES OF ABSOLUTISM, ENLIGHTENMENT, AND REASON. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study is directed toward topics of particular interest in the history of a European nation or region during the ages of Absolutism, Enlightenment, and Reason.

HIST 607. SEMINAR IN EUROPEAN HISTORY: FRENCH REVOLUTION AND NINETEENTH CENTURY. Cr. 3. Admission by consent of instructor.

Individual and group study directed toward topics of particular interest in the history of a European nation or region during the period from 1789 to 1900.

HIST 609. SEMINAR IN EUROPEAN HISTORY IN THE TWENTIETH CENTURY. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study directed toward topics of particular interest in the history of a European nation or region during the period since 1900.

HIST 651. READING SEMINAR IN AMERICAN HISTORY. Cr. 1-3. Graduate standing. May be repeated for credit.

Bibliography and historiography of selected fields or topics in American history; may vary in subject matter from semester to semester.

HIST 653. SEMINAR IN AMERICAN COLONIAL HISTORY AND THE AMERICAN REVOLUTION. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study of selected topics in American history from the first European colonization through the American Revolution.

HIST 655. SEMINAR IN AMERICAN HISTORY: THE NATIONAL PERIOD TO 1850. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study of selected topics in American history from the early National Period to 1850.

HIST 657. SEMINAR IN AMERICAN HISTORY: 1850 TO WORLD WAR I. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study of selected topics in American history from the midnineteenth century to the end of the World War I period.

HIST 659. SEMINAR IN AMERICAN HISTORY: WORLD WAR I TO THE PRESENT. Cr. 3. Admission by consent of instructor. May be repeated for credit.

Individual and group study of selected topics in American history from World War I to the present.

HIST 661. SEMINAR IN U.S. FOREIGN AFFAIRS AND NATIONAL SECURITY POLICY. Cr. 3. Admission by consent of instructor. May be repeated for credit.

A series of studies in depth based upon individual research and group study of selected topics relating to foreign affairs, military affairs, and defense policies of the United States from the Revolution to the present.

POLITICAL SCIENCE

UNDERGRADUATE LEVEL

POL 100. THE POLITICS OF CHANGE. Class 4, cr. 3.

An introductory survey of the political forces at play in the processes of social, economic, and political change. Among topics to be considered are the politics of: the post-industrial revolution, environmental control, civil rights, the role of women in society, international co-operation and conflict. Emphasis will be placed on the political forces and processes involved in change and the resultant public policies.

POL 101. AMERICAN GOVERNMENT AND POLITICS. Class 3, cr. 3.

A study of the nature of democratic government, the U.S. Constitution, federalism, civil rights, political dynamics, the presidency, Congress, and the judiciary.

POL 104. AMERICAN POLITICAL BEHAVIOR. Class 3, cr. 3.

An introduction to the major dimensions of citizen politics in America: voting behavior, political socialization of children and adults, political opinion and culture, leadership recruitment and partisan participation.

POL 130. INTRODUCTION TO INTERNATIONAL RELATIONS. Class 3, cr. 3.

An analysis of the fundamentals of international law, organization, and politics particularly as relevant to contemporary international relations.

POL 141. INTRODUCTION TO COMPARATIVE POLITICS. Class 3, cr. 3.

Introductory survey of major foreign governments, including the governments of a western democracy, a communist state, and a developing country, with special attention to the historical, cultural, and constitutional development, the organization and ideologies of political parties, and current political problems.

POL 231. INTRODUCTION TO UNITED STATES FOREIGN POLICY. Class 3, cr. 3.

This course is designed to introduce students to the major themes and issues in contemporary United States foreign policy. Lectures, discussions and readings will examine such areas as United States relationships with the major powers, the Third World and international organizations.

POL 300. INTRODUCTION TO POLITICAL ANALYSIS. Class 3, cr. 3.

An introduction to the study of politics, its basic concepts and major areas of concern; also review of important research techniques, including methods of data collection and analysis.

POL 302. INTRODUCTION TO POLITICAL THINKING. Class 3, cr. 3.

An introductory study of political concepts and systems of political thought from classical to modern times.

POL 315. PUBLIC OPINION AND ELECTIONS. Class 3, cr. 3. Prerequisite: POL 101 or 104 or consent of instructor.

Contemporary public opinion, political socialization, and voting behavior in America.

POL 333. REFORM, PROTEST, AND REVOLUTION. Class 3, cr. 3. Prerequisite: POL 100 or 101 or the consent of the instructor.

A study of political change ranging from legal reform to peaceful protest to violent revolution. Emphasis on ideologies and strategies of change relevant to consideration of contemporary political change.

POL 370. INTRODUCTION TO COMPARATIVE STATE POLITICS. Class 3, cr. 3.

An introduction to the structure and process of state government, including the legal and political relationships between the state and local units of government.

POL 371. INTRODUCTION TO COMPARATIVE URBAN POLITICS. Class 3, cr. 3.

The politics of governing urban areas, including the selection of political leaders, and citizen participation in the decision making of the central city. Special attention will be given to the integration of minorities into the political and social life of the city.

POL 380. THE POLITICS OF BUREAUCRACY. Class 3, cr. 3.

Organization, functions, and principles of public administration, and its relationship to other branches of the government.

POL 400. PRINCIPLES OF EMPIRICAL POLITICAL ANALYSIS. Class 3, cr. 3. Prerequisite: POL 300 or consent of instructor.

An intermediate critical treatment of the scientific approach to the study of political behavior. Focus on the advantages and problems of analyzing political phenomena in terms of the following elements of scientific methodology: classification, measurement, generalization, verification, reliability, validity, causal inference and prediction. The importance of these elements for understanding politics will be illustrated by analyzing empirical studies drawn from various fields of political behavior.

POL 401. PRACTICUM IN LOCAL GOVERNMENT. Class 1, Lab 3, cr. 3.

Observation and supervised participation on an official community committee or board. Readings and class meetings to integrate theory and experience.

POL 404. DEMOCRATIC ELITISM. Class 3, cr. 3.

The role of political elites in a democracy, including consideration of alternative modes of recruitment, circulation, and accountability as viewed by Mills, Mosca, Pareto, and other elite theorists. Focus on how political elites can strengthen or threaten the functioning of democracy, in modern American society.

POL 429. CONTEMPORARY POLITICAL PROBLEMS. Class 3, cr. 3. (May be repeated for credit from a different instructor.)

Contemporary political problems in the United States affecting the interpretation of democracy, human rights and welfare, social pressures, and intergovernmental relations.

POL 433. INTERNATIONAL ORGANIZATION. Class 3, cr. 3. Prerequisite: POL 130 or consent of instructor.

A study of the structure and functions of the United Nations and associated agencies with an emphasis on the role of this system in contemporary international relations.

POL 435. INTERNATIONAL LAW. Class 3, cr. 3. Prerequisite: POL 130 or consent of instructor.

A study of international legal theories, principles, and practices with an emphasis on the role and utility of law in contemporary international relations.

POL 442. THE SOVIET POLITICAL SYSTEM. Class 3, cr. 3. Prerequisite: POL 141 or 303, or consent of instructor.

Analysis of Russian political culture and the Russian political tradition. History, organization, and functioning of the Communist Party and the governmental apparatus. The role of the "social organizations," interest groups, and elites. Models of the Soviet political system.

POL 454. SELECTED PROBLEMS IN MATERIALIST POLITICAL THOUGHT. Class 3, cr. 3. (May be repeated for credit.)

Discussion and analysis of representative works and major schools of political theory which take a materialistic or naturalistic approach to the description and evaluation of political phenomena, e.g., the thought of Hobbes or of Marx, or psychoanalytic theories of politics. Emphasizes textural analysis and logical structure of the works examined and considers their applicability to contemporary political life.

POL 460. JUDICIAL POLITICS. Class 3, cr. 3. Prerequisite: POL 101 or consent of instructor.

A survey of judicial processes as they operate in America. Both trial courts and appellate courts will be examined in light of the procedures with which they operate. The external social, economic, and political pressures surrounding courts, and the impact courts have on society will be considered.

POL 493. INTERDISCIPLINARY UNDERGRADUATE SEMINAR. Class 1-3, cr. 1-3. (Same as HIST 493, PHIL 493, PSY 493, SOC 493, and THTR 493.) Prerequisite: consent of instructor. (May be repeated for credit.)

An undergraduate seminar devoted to an interdisciplinary examination of social, economic, political, and intellectual movements, using the faculty resources of the participating departments. Subject matter will vary. Each offering of the seminar will be approved by a committee of department heads from the sponsoring departments.

DUAL LEVEL
Undergraduate-Graduate

POL 501. POLITICAL SCIENCE: METHODOLOGY. Class 3, cr. 3. Prerequisites: six hours of political science and consent of instructor.

Introduction to the basic techniques of statistical analysis applicable to political science data. Elementary descriptive statistics and statistical inference. Introduction to multivariate analysis.

POL 502. PHILOSOPHY OF POLITICAL INQUIRY. Class 3, cr. 3.

Intensive analysis of various philosophical problems in political inquiry. Special emphasis is given to problems in the philosophy of science,meta-ethics and analytic value theory, sociology of knowledge, ontology and metaphysics, and conceptualization of political language.

POL 510. POLITICAL PARTIES AND POLITICS. Class 3, cr. 3. Must be preceded by junior standing or above.

An analysis of the nature and functioning of U.S. political parties in terms of social and economic forces that shape our political system. Interactions among political parties, pressure groups, and formal governmental structures are emphasized throughout. Special attention is devoted to political leadership, nominating processes, campaign management, voting behavior, and other important aspects of American politics.

POL 511. CONGRESS: STRUCTURE AND FUNCTIONING. Class 3, cr. 3. Must be preceded by junior standing or above.

A study of how Congress actually operates. Formal and informal power structures within both chambers and roles of the individual members of Congress are analyzed. Attention is directed to latent as well as manifest functions of legislative, investigative, and other major activities of Congress. The problem of bringing expertise to bear on the legislative process is considered throughout.

POL 514. THE PRESIDENT AND THE POLICY PROCESS. Class 3, cr. 3. Prerequisite: POL 101, 301, or equivalent.

A study of presidential leadership as the embodiment of social forces and as reflective of the personality of the incumbent; the president as national leader reflecting national myths and idealogies; the growth of the presidency; issues and forces affecting the continuity of presidental leadership; degree of institutionalization of the presidency.

POL 542. COMMUNIST POLITICAL SYSTEMS. Class 3, cr. 3. Prerequisite: POL 442 or equivalent, or consent of instructor.

Advanced study of selected problems in the politics of Communist countries. The course will focus on such issues as the nationalities problem, political dissent, and opposition in the USSR and other Communist countries; the role of elites and interest groups within the context of a single-party system; as well as specific functions of the ruling Communist Party, e.g., indoctrination, leadership, and recruitment. The place of Communist studies in political science.

POL 560. CONSTITUTIONAL LAW Class 3, cr. 3. Must be preceded by POL 101.

A survey of selected areas of constitutional law, considering the political and social influences as well as the doctrinal forces which have produced these policies and interpretations.

POL 562. ADMINISTRATIVE LAW AND POLICY MAKING. Class 3, cr. 3. Must be preceded by POL 101.

An examination of policy-making procedures in administrative agencies as established by statute, precedent, and political considerations.

Administrative agencies will be studied by means of focusing on the political context in which they must operate. Emphasis will be placed on the political realities of administrative agency operation.

POL 565. CURRENT POLITICAL IDEOLOGIES. Class 3, cr. 3. Prerequisite: POL 350.

Democracy, socialism, fascism, communism, and other political ideologies.

POL 570. SPECIAL PROBLEMS IN COMPARATIVE STATE POLITICS. Class 3, cr. 3. Prerequisite: POL 370.

The latest research into state politics will be the basis for intensive analysis of selected processes and institutions. Individual research into areas of particular interest.

POL 571. SPECIAL PROBLEMS IN COMPARATIVE URBAN POLITICS. Class 3, cr. 3.

A study of the legal, political, and sociological characteristics of the municipality. Particular emphasis on the politics of Urban America.

POL 581. ADMINISTRATIVE POLICY-MAKING AND ORGANIZATIONAL THEORY. Class 3, cr. 3. Must be preceded by POL 380 or consent of instructor.

The administrative process from points of view of the behavioral sciences and dealing with such problems as leadership, motivation, morale, decision-making, and communication.

POL 590. DIRECTED READING IN POLITICAL SCIENCE. Cr. 1-3. (May be repeated for credit.)

A reading course directed by the instructor in whose particular field of specialization the content of the reading falls. Approval of each reading project must be secured from the department.

School of Science and Nursing

Larry S. Johnson, Dean

The primary mission in the school is to provide quality instruction in the academic disciplines represented by the departments within the school. Although its orientation is towards the sciences and nursing, the faculty recognizes its responsibility to provide instruction in appropriate disciplines, in the areas of general education, teacher training, and pre-professional preparation. Keeping in mind its traditions in instruction, the school recognizes the importance of research and innovation in maintaining and improving the value and relevance of the learning experience it provides for its students. The faculty accepts its responsibility to serve the larger community through research, consulting services, and the furnishing of resource people, in cases where its particular expertise makes such services appropriate.

The School of Science and Nursing is organized around four departments as follows:

Department of Biology
Department of Chemistry and Physics
Department of Mathematical Sciences
Department of Nursing

The general baccalaureate requirements for a student majoring in a curriculum offered by the School of Science and Nursing are as follows (these requirements are minimal and the student must complete any additions or further specifications imposed by the student's major department):

1. A total of 124 semester hours;
2. At least 24 semester hours from humanities, language arts, social sciences and economics. (Education and physical educational courses may not be used to fulfill this requirement. Included in these 24 semester hours must be English 103, completed with a grade of C or better or English 104 and English 105, or English 104 completed with a grade of A, and, with the permission of the 104 instructor, any literature or writing course may be substituted for ENGL 105);
3. A minimum of 12 credit hours in courses that require associated laboratories in the physical and biological sciences outside of the student's major subject area. With the permission of the major department, a maximum of six credit hours used to satisfy this requirement may be computer science and engineering courses involving laboratory exercises.

The science and mathematics departments in the School of Science and Nursing have programs of study designed for prospective teachers. These school teaching degree programs meet the Indiana certification requirements. Programs are available in both mathematics and science teaching. Students should see the advisor in Science Education concerning the science teaching program. Advisors are available in the mathematics department for those desiring information about the Mathematics Teaching Program.

PASS/NOT PASS OPTION

In order to provide students with the opportunity to broaden their educational foundations with minimal concern for grades earned, an alternative grading system, the pass/not pass option, has been established.

1. The option is open to all students in the University subject to the regulations of the school in which the student is enrolled. In particular, the School of Science and Nursing has specified under what conditions a course that is passed under this option may be used to satisfy the graduation requirements of its various programs.
2. Subject to the specific program regulations below, a student may elect this option in any course which does not already appear on his academic record and in which he is otherwise eligible to enroll for credit with letter grade. A student may not elect this option for more than 20 percent of the total credit hours required for his graduation.
3. The registrar's class rosters will indicate which students have elected this option.
4. A student who is enrolled in a course under this option has the same obligation as those who are enrolled in the course for credit with letter grade. When the instructor reports final grades in the course, he will report that any such student who would have earned a grade of A, B, or C has passed the course, and that any other such student has not passed. The registrar will make an appropriate notation on the student's academic record in place of a letter grade but will not use the course in computing grade indices.

In addition to these general regulations, the School of Science and Nursing has its own limitations on the types and uses of courses elected under this option in its various program. The following rules are currently applicable:

Agriculture

Students who are classified as sophomore 3 or above and possess a graduation index of 4.00 or greater may elect the pass/not pass grading option. No more than 21 credits of elective courses taken under the pass/not pass option may be used toward graduation requirements.

Biology (except Agriculture), Chemistry (except Chemical Technology), Mathematics and Physics

1. The option is open only to students who are classified as sophomores or upper division students with an index of 4.5 or above.
2. A student is to take no more than two such courses per year. Summer session courses shall apply to the year preceding the summer session.
3. So far as courses presented to satisfy degree requirements are concerned, only free electives and courses in the 18-hour block in humanities and behavioral and social sciences may be taken under the pass/not pass option. Such courses may be used to satisfy the 18-hour block only if those chosen are more advanced than those usually elected at the student's level.

Chemical Technology and Nursing

1. No student will be permitted to choose the pass/not pass option until the student's advisor is in agreement that this appears to be a desirable course for the student to pursue in this particular situation.

SCIENCE COURSES

L.S. Johnson, in charge

UNDERGRADUATE LEVEL

SCI 300. INTERDISCIPLINARY SCIENCE AND SOCIAL IMPLICATIONS. Class 2, Lab. 2, cr. 3.

This course will help the student analyze the impact of evolving scientific knowledge and the resulting technological advances on social, political, and economic systems. Included will be the identification of the effects of chemicals and nutrition on personal well-being.

DEPARTMENT OF BIOLOGY

Jane R. Shoup, Head

FACULTY: K.L. Anderson, T.J. Dougherty, R.L. Peloquin, J.R. Shoup, C.C. Tseng, J.F. Wermuth, R.J. Werth, K.S. Wilson

The Department of Biology offers three programs leading to the Bachelor of Science degree, a one-year program in Pre-pharmacy, and three two-year transfer programs offered in cooperation with the School of Agriculture. The Department also offers courses for students planning to use Biology as a primary teaching area. These are:

1. **The Biology Program.** This program is designed for students interested in any of the areas of basic biology. By choosing an appropriate plan of study within this program a student can emphasize botany, microbiology, zoology, or general biology either with the B.S. as a terminal degree or in preparation for graduate work.
2. **The Premedical and Predental Program.** The plans of study in this program differ from those in the preceding program only in requiring fewer credits in biology and in providing an opportunity for some students to fulfill their requirements for the B.S. by taking three-fourths of the total credit hours required for graduation, including all required courses, in six semesters and successful completion of the first year at an accredited medical or dental school. Premedical and predental students must consult catalogs of medical and dental schools to which they wish to apply for specifc entrance requirements. Also, it should be noted that majors other than in science are acceptable to some medical and dental schools.
3. **The Medical Technology Program.** The plans of study in this program include six semesters of work at Purdue University covering three-fourths of the total credit hours required for graduation and all required courses. Students accepted into the clinical program at an affiliated school will receive the B.S. in Medical Technology from Purdue Calumet upon completion of the 12-month hospital curriculum. Clinical affiliates of Purdue Calumet's Medical Technology program include St. Margaret's Hospital, Hammond; St. Mary's Medical Center, Gary; Northwest Community Hospital, Arlington Heights, IL.; and Foster McGaw Hospital of Loyola University, Chicago, IL.
4. **The Prepharmacy Program.** Students wishing to prepare for the profession of pharmacy may complete one year of prepharmacy on this campus. The application for admission to the School of Pharmacy and Pharmacal Sciences (West Lafayette Campus) must be submitted before January 2 to insure consideration for the fall semester.
5. **Programs in the School of Agriculture.** The first two years of the General Agriculture (e.g., Agronomy, Landscape Architecture, Animal Science, etc.), Preforestry, and Preveterinary Medicine programs are offered within the

Biology Department. Plans of study are outlined under School of Agriculture offerings in the section titled "Transfer Programs." (See page 245.)

6. **Secondary Science with Biology as a Primary Teaching Area.** The plans of study are designed for prospective secondary school teachers who wish to use Biology as a primary teaching area. Such students must complete the requirements for certification imposed by the state in which they expect to teach. Students should consult a science education advisor for details.

General Education Requirements for Biology, Premedicine, Predentistry, and Medical Technology

1. A total of 124 semester hours of credit.
2. English composition (3-6 credits). ENGL 103 with a grade of C or better, or ENGL 104 and 105 is required. Students who complete ENGL 104 with a grade of A may substitute any literature or writing course for ENGL 105 with the permission of the 104 instructor.
3. Modern foreign language: French, German, or Spanish (0-6 credits).
   All Biology, Premedical, and Predental majors must pass a second semester college-level course in a modern foreign language or an equivalent proficiency examination. Medical Technology majors are encouraged to complete two semesters of foreign language.
4. Humanities, social studies, and behavioral sciences (18 credits). Students must select 18 hours from the areas listed below. Six hours must be chosen from each of two of them. A coherent two-course sequence must be included.
   a. literature, philosophy, creative arts;
   b. history, political science;
   c. economics, sociology, psychology;
   d. modern language (up to 6 credits)
      (1) Biology, Premedical, and Predental majors may use third- and/or fourth- semester modern language
      (2) Medical Technology majors may use first and/or second semester modern language
5. Mathematics (12-13 credits). Students may choose either one of the sequences below:

(a) MA 223, 224 (Introductory Analysis) and (6)
any two of the following (6)
STAT 301 (Elementary Statistical Methods I)
STAT 502 (Experimental Statistical Methods II)
CS 220 (Introduction to Algorithmic Processes)
MA 213 (Finite Mathematics)

(b) for students wishing to take a higher level of mathematics or planning to take Physics sequence (b) and/or Physical Chemistry (CHM 373, 374):
MA 163, 164 (Intergrated & Analytic Geometry) (10)
either of the following:
STAT 301 (Elementary Statistical Methods I)
CS 220 (Introduction to Algorithmic Processes)

Students who plan to enter quantitative areas of biology should also take MA 261 (Multivariate Calculus) and MA 262 (Linear Algebra and Differential Equations).

Students with deficient high school mathematics are advised to take MA 151 or MA 153, 154 (Algebra and Trigonometry) prior to either of the above sequences.

6. Physics (8-13 credits). Students may choose either one of the sequences below:
   (a) PHYS 220,221 (General Physics) (8)
   (b) recommended for students planning to take advanced physics courses (prerequisites MA 163, 164)
   PHYS 152(Mechanics) (4)
   PHYS 251 (Heat, Electricity, and Optics) (5)
   PHYS 342, 343 (Modern Physics) (4)

7. Chemistry (20-23 credits). Students may choose any one of the sequences below. Consult advisor.
   (a) CHM 111, 112 (General Chemistry) (6)
   CHM 223 (Introductory Qualitative Analysis) (4)
   CHM 224 (Introductory Quantitative Analysis) (4)
   CHM 254, 255, 256, 258 (Organic Chemistry) (8)
   (b) for students with a strong high school chemistry background
   CHM 115, 116 (General Chemistry) (8)
   CHM 224 (Introductory Quantitative Analysis) (4)
   CHM 254, 255, 256, 258 (Organic Chemistry) (8)
   or CHM 261, 262, 263, 264 (Organic Chemistry)
   (c) for students with a strong high school chemistry background who plan to specialize in quantitative areas of biology
   CHM 115, 116 (General Chemistry) (8)
   CHM 220 (General Chemistry) (3)
   CHM 321 (Analytical Chemistry) (4)
   CHM 254, 255, 256, 258 (Organic Chemistry) (8)
   or CHM 261, 262, 263, 264 (Organic Chemistry)

8. Biology
   (a) All Biology, Premedical, Predental majors, and Secondary Science Education majors with Biology as a primary teaching area must take:
   A. Required courses (23-24 credits)
   (1) BIOL 101, 102 (Introductory Biology) (8)
   (2) One of the following:
   BIOL 207 (Plant Morphology), 208 (Vertebrate Histology and Organology), or 220/221 (Introduction to Microbiology) (3 or 4)
   (3) BIOL 285 (Environmental Biology) (4)
   (4) One of the following:
   BIOL 320, 321 (Introductory Cell Biology), 350 (Plant Physiology), or 357 (Introductory Animal Physiology) (4)
   (5) BIOL/AGRY 429, 430 (Genetics) (4)
   B. Electives (9-10 credits)
   Choose additional biology courses at 300 to 500-level to total at least 33 credits. (9 or 10)

Students concentrating in microbiology should accumulate 33 credits in Biology, 20 of which must be in microbiology in order to qualify for the National Registry of Microbiologists established by the American Academy of Microbiology, or to meet U.S. Civil Service classification requirements. Consult an advisor for appropriate courses.

(b) Medical Technology majors must take:

A. Required courses (18-19 credits)
   (1) BIOL 101, 102 (Introductory Biology) (8)
   (2) BIOL 220/221 (Introduction to Microbiology) (3 or 4)
   (3) either of the following:
   BIOL 320, 321 (Introductory Cell Biology) or
   BIOL 357 (Introductory Animal Physiology) (4)
   (4) BIOL/AGRY430 (Genetics) (3)

B. Elective courses
   Choose additional courses at 300 to 500-level to total at least 28 credits in Biology. Especially recommended are: (9 or 10)
   BIOL 340, 341 (Human Physiology)
   BIOL 522, 523 (Cytology)
   BIOL 524 (Microbiology)
   BIOL 527, 528 (General Mycology)
   BIOL 533, 534 (Medical Microbiology)

9. Remaining electives (12-24) credits. Biology, Premedical, Predental, and Medical Technology majors.
   Premedical and predental students may substitute successful completion of the first year in an accredited medical or dental school for these electives.
   Medical technology majors may substitute successful completion of 12 months training in a school of medical technology (approved by the Board of Schools of Medical Technology of the American Society of Clinical Pathologists and by Purdue University). Students wishing to continue residence at Purdue University for a fourth year must complete the same requirements as do Biology majors.

SAMPLE PLANS OF STUDY

Programs 1 and 2: Biology, Premedicine, and Predentistry

FRESHMAN YEAR

First Semester	**Second Semester**
(4)BIOL 101 (Introductory Biology)	(4) BIOL 102 (Introductory Biology)
(3-4)CHM 111 (General Chemistry) or CHM 115 (General Chemistry)	(3-4) CHM 112 (General Chemistry) or CHM 116 (General Chemistry)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Compostion II)
(3-5) MA 223 (Introductory Analysis I) or MA 163 (Integrated Calculus and Analytic Geometry I)	(3-5) MA 224 (Introductory Analysis II) or MA 164 (Integrated Calculus and Analytic Geometry II)
(3)Modern Language 101	(3) Modern Language 102
(16-19)	(16-19)

SOPHOMORE YEAR

Third Semester

(3-4) BIOL 208 (Vertebrate Histology and Organology) or BIOL 220/221 (Introduction to Microbiology) or Elective
(4) CHM 254, 255 (Organic Chemistry)
(4) BIOL 285 (Environmental Biology)
(3) Modern Language 203
(3) HESS elective or CS 220 (Introduction to Algorithmic Processes)

(17-18)

Fourth Semester

(3-4) BIOL 207 (Plant Morphology) or BIOL 220/221 (Introduction to Microbiology) or HESS elective
(3-4) HESS elective or CHM 223 (Introductory Qualitative Analysis)
(4) CHM 256, 258 (Organic Chemistry)
(3) STAT 301 (Elementary Statistical Methods)
(3) Modern Language 204

(16-18)

JUNIOR YEAR

Fifth Semester

(4) BIOL 320, 321 (Introductory Cell Biology) or BIOL elective
(4) PHYS 220 (General Physics)
(3-4) HESS elective or CHM 223 (Introductory Qualitative Analysis)
(3) HESS elective
(4) BIOL elective

(18-19)

Sixth Semester

(4) BIOL/AGRY 429, 430 (Genetics) or BIOL elective
(4) BIOL 350 (Plant Physiology) or BIOL 357 (Introduction to Animal Physiology)
(4) PHYS 221 (General Physics)
(4) CHM 224 (Introductory Quantitative Analysis)
(3) HESS elective

(19)

SENIOR YEAR

(Alternative: one year at accepted Medical or Dental School)

Seventh Semester

(3-4) BIOL elective
(3-4) BIOL elective
(3-4) elective
(3) HESS elective

(12-15)

Eighth Semester

(3-4) BIOL elective
(3-4) BIOL elective
(3-4) elective
(3) HESS elective

(12-15)

Program 3: Medical Technology

FRESHMAN YEAR

(Same as Programs 1 and 2)

SOPHOMORE YEAR

Third Semester

(3-4) BIOL 220/221 (Introduction to Microbiology) or HESS elective
(4) CHM 254, 255 (Organic Chemistry)
(3) CS 220 (Introduction to Algorithmic Processes)
(3-4) HESS elective or CHM 233 (Introductory Qualitative Analysis)
(3) HESS elective

(16-18)

Fourth Semester

(4) BIOL 357 (Introductory Animal Physiology) or BIOL elective
(4)CHM 256, 258 (Organic Chemistry)
(3) STAT 301 (Elementary Statistical Methods)
(3-4) HESS elective or CHM 223 (Introductory Qualitative Analysis)
(3-4) HESS elective or BIOL elective

(17-19)

JUNIOR YEAR

Fifth Semester

(4) BIOL 320, 321 (Introductory Cell Biology) or BIOL elective
(4) BIOL elective
(4) PHYS 220 (General Physics)
(3) HESS elective

(15)

Sixth Semester

(3) BIOL 430 (Genetics)
(4) CHM 224 (Introductory Quantitative Analysis)
(4) PHYS 221 (General Physics)
(3) HESS elective
(3) HESS elective

(17)

SENIOR YEAR

12 months training in an affiliated school of medical technology

Program 4: Prepharmacy

PREPHARMACY YEAR

First Semester

(4) BIOL 109 (Biology of Animals)
(4)CHM 115 (General Chemistry)
(3) ENGL 104 (English Composition I)
(3-5) MA 223 (Introductory Analysis) or MA 153 (Algebra and Trigonometry I) or MA 163 (Integrated Calculus Analytic Geometry I)
(1-3) HESS elective

(15-19)

Second Semester

(4) BIOL 108 (Biology of Plants)
(4) CHM 116 (General Chemistry)
(3) ENGL 105 (English Composition II)
(3) MA 224 (Introductory Analysis II) or MA 154 (Algebra and Trigonometry II)
(1-3) HESS elective

(15-17)

Students with adequate preparation may substitute MA 163 for the sequence MA 223-224.

Students with insufficient preparation may take MA 153-154 in the Freshman year and a mathematical analysis course during the Sophomore year (second year of five), in the School of Pharmacy and Pharmacal Sciences.

Although CHM 111-112, 223 may be substituted for CHM 115-116, the latter sequence is preferred.

Each student should complete at least 32 credits during his prepharmacy year. Specific elective courses are not required; students may choose electives that coincide with their interests. It is recommended that a speech course be included if possible.

Students who do not receive their pre-pharmacy instruction on the Purdue West Lafayette Campus must schedule two one-hour courses after transferring: CLPH 100 and CLPH 101 (Pharmacy Orientation).

UNDERGRADUATE LEVEL

BIOL 101. INTRODUCTORY BIOLOGY. Class 3, Lab. 3, cr.4

Morphology, physiology, and systematics of organisms. Laboratories include survey of representative taxa.

BIOL 102. INTRODUCTORY BIOLOGY. Class 3, Lab. 3, cr. 4.

The biology of cells and populations. Basic chemistry, cell structure and physiology, cell division, genetics, evolution, and ecology. Laboratories include illustration of basic concepts with emphasis on data collection and interpretation.

BIOL 108. BIOLOGY OF PLANTS. Class 2, Lab. 4, cr. 4.

Introduction to the growth, functioning structures, heredity, diversity of plants, and their interactions with the environment.

BIOL 109. BIOLOGY OF ANIMALS. Class 2, Lab. 4, cr 4.

Introduction to the structure, functioning, heredity, development, classification, and evolution of animals, and their interactions with the environment.

BIOL 175. FLORA OF CALUMET REGION. cr. 2.

Identification and recognition of the flora of the Calumet Region. The emphasis is on field work that acquaints the student with the principal plant groups and species of the local flora. The course may not be used to fulfill the laboratory science requirement in the School of Science and Nursing.

BIOL 203. HUMAN ANATOMY AND PHYSIOLOGY. Class 2, Lab. 2, cr. 3.

Introduction to human biology with emphasis on anatomy and physiology.

BIOL 204. HUMAN ANATOMY AND PHYSIOLOGY. Class 2, Lab. 2, cr. 3. Prerequisite: BIOL 203.

Continuation of BIOL 203.

BIOL 207. PLANT MORPHOLOGY. Class 2, Lab. 4, cr 3. Prerequisite: two semesters of biological science.

Survey of the plant kingdom with the study of structure as related to function, reproductive processes, classification, and phylogenetic relationships of principal plant groups.

BIOL 208. VERTEBRATE HISTOLOGY AND ORGANOLOGY. Class 2, Lab. 4, cr. 3. Prerequisite: two semesters of biological science.

Study of fundamental aspects of tissue and organ structure and function in vertebrates.

BIOL 211. THE SOCIAL IMPACT OF THE BIOLOGICAL SCIENCES. Class 2, Lab. 2, cr 3.

An introduction to basic concepts, experimentation, and information found within the biological sciences. Emphasis is placed upon the role of biology within the social framework. Relationships between this discipline and common social problems are explored.

BIOL 212. THE SOCIAL IMPACT OF THE BIOLOGICAL SCIENCES. Class 2, Lab. 2, cr. 3.

A continuation of BIOL 211. It is recommended that this course be preceded by BIOL 211.

BIOL 220. INTRODUCTION TO MICROBIOLOGY. Class 3, Lab. 2, cr. 3. Prerequisites: one year of general chemistry and one semester of a life science.

The isolation, growth, structure, functioning, heredity, identification, classification, and ecology of microorganisms, their role in nature and significance to man.

BIOL 221. INTRODUCTION TO MICROBIOLOGY. Class 3, Lab. 3, cr. 4. Prerequisites: one year of general chemistry and one semester of a life science.

The isolation, growth, structure, functioning, heredity, identification, classification, and ecology of microorganisms, their role in nature and significance to man.

BIOL 285. ENVIRONMENTAL BIOLOGY. Class 2, Lab. 4, cr. 4. Prerequisites: one year of life science and one year of general chemistry.

Adaptation and competition, and the relationship of organisms to their physical environment. Natural selection and other aspects of evolution; origin and integration of species and communities; ecosystems.

BIOL 295. SPECIAL ASSIGNMENTS. Cr. 1-4.

Reading, discussions, written reports or laboratory work selected for enrichment in special

areas of the biological sciences. Consent of the instructor required. May be repeated for credit.

BIOL 320. INTRODUCTORY CELL BIOLOGY. Class 2, cr. 2. Prerequisite: one semester of life science and one semester of organic chemistry; corequisite: BIOL 321, unless by consent of instructor.

Structure and function of prokaryotic and eukaryotic cells, emphasizing biochemistry and physiology.

BIOL 321. LABORATORY IN INTRODUCTORY CELL BIOLOGY. Lab. 4, cr. 2. Prerequisite or corequisite: BIOL 320.

BIOL 340. HUMAN PHYSIOLOGY. Class 3, cr. 3. Prerequisites: CHM 119, CHM 219 (or equivalents): BIOL 203-204 (or equivalents; or consent of instructor.

A study of human physiology for students entering health oriented fields. The following systems will be examined: nervous, muscular, circulatory, respiratory, urinary, digestive, and endocrine. Emphasis on the relationship of function to structure at various levels of organization. Attention will be drawn to homeostatic mechanisms and intersystem interactions.

BIOL 341. LAB IN HUMAN PHYSIOLOGY. Lab. 4, cr. 2. Corequisite: BIOL 340.

BIOL 350. INTRODUCTION TO PLANT PHYSIOLOGY. Class 3, Lab. 3, cr. 4. Prerequisites: BIOL 108 or one year of life science, one semester of organic chemistry.

Fundamentals of plant physiology with emphasis on applications to plant development.

BIOL 357. INTRODUCTORY ANIMAL PHYSIOLOGY. Class 3, Lab. 3, cr. 4. Prerequisites: one year of life science and CHM 116 or equivalent.

A system of analysis of animal physiology. With emphasis on mammals, the operation of systems such as respiratory, cardiovascular, neuromuscular, and endocrine will be considered. Interactions between components of individual systems as well as intersystem interaction is discussed.

BIOL 429. GENETICS LABORATORY. Lab. 2, cr. 1. Prerequisite or corequisite: BIOL 430.

Experiments and demonstrations with higher plants, fruit flies, flour beetles, mice, bacteria, viruses, and fungi to elucidate the basic principles of genetics.

BIOL 430. GENETICS. Class 3, cr. 3. Prerequisite: one year of life science.

The transmission of heritable traits, probability; genotypic-environmental interactions; chromosomal abberations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding.

BIOL 440 HERPETOLOGY. Class 2, Lab. 2, cr. 3. Prerequisites: one year of life science and one year of general chemistry. Recommended: BIOL 285, Environmental Biology.

The evolution, paleontology, taxonomy, morphology, physiology, ecology, and geographic distribution of amphibians and reptiles. Museum techniques, biosystematics, preservation, and caring for specimens is included. Field work emphasizes collection and identification of Indiana species.

BIOL 482. BIOLOGICAL CONSERVATION. Class 2, Lab. 3, cr.3.

General principles of conservation with emphasis on the wise use of the total environment. Study of threats to species, including man, and of threats to natural communities.

BIOL 495. SPECIAL ASSIGNMENTS. Cr. 1-4.

Reading, discussions, written reports or laboratory work selected for enrichment in special areas of the biological sciences. Consent of the instructor required. May be repeated for credit.

DUAL LEVEL
(Undergraduate-Graduate)

BIOL 505. BIOLOGY OF INVERTEBRATE ANIMALS. Class 2, Lab. 4, cr. 4. Prerequisites: BIOL 109 or equivalent.

A survey of the invertebrate animals, their morphology, physiology, ecology, and phylogeny.

BIOL 520. EUKARYOTIC CELL BIOLOGY. Class 2, cr. 2 or Class 3, Lab. 3, cr. 4. Prerequisites: one semester of a life science and one semester of organic chemistry; corequisite: BIOL 521, unless by consent of instructor.

Composition, structure, heredity, and growth of cells. Analysis of the cell concept in biochemical terms.

BIOL 521. LABORATORY IN CELL BIOLOGY. Lab. 4, cr. 2. Prerequisite of corequisite: BIOL 520.

BIOL 522. CYTOLOGY. Class 2, cr. 2. Prerequisites: one year of life science, one semester of organic chemistry.

The molecular basis for structure in animals and plant cells. Organization and function of subcellular organelles. Energy transduction. Cell division and organelle development.

BIOL 523. LABORATORY IN CYTOLOGY. Lab. 4. cr. 2. Prerequisite or corequisite: BIOL 522.

Isolation of cellular organelles and light microscope study of cell structure.

BIOL 524. MICROBIOLOGY. Class 3, cr. 3, or Class 2, Lab. 4, cr. 4. Prerequisites: BIOL 220 or 221, or consent of instructor.

Emphasis on bacteria and viruses and intensive study of their isolation, composition, structure, reproduction, and death; identification, classi-

fication, ecology, role in nature, and significance to man.

BIOL 527. GENERAL MYCOLOGY. Class 2, Lab. 3, cr. 3. Prerequisite: one semester of microbiology; corequisite: BIOL 528, unless by consent of instructor.

Survey of fungi with emphasis on form, structure, genetics, growth, nutrition, and classification.

BIOL 528 LABORATORY IN GENERAL MYCOLOGY. Lab. 4, cr. 2 or Lab. 2, cr. 1. Prerequisite or corequisite: BIOL 527.

BIOL 533. MEDICAL MICROBIOLOGY. Class 3, cr. 3. Prerequisite: BIOL 220 or 221.

Properties of microorganisms associated with infectious diseases. Interactions of microorganisms and their hosts. Principles of immunology and serology.

BIOL 534. LABORATORY IN MEDICAL MICROBIOLOGY. Lab. 4, cr. 2. Must be preceded or accompained by BIOL 533.

BIOL 541. GENETIC BIOLOGY. Class 3, Lab. 2, cr. 4. Prerequisites: BIOL 320, 321, and one year of organic chemistry, or consent of instructor.

Quantitative, molecular, and physiological genetics, including a review of classical principles.

BIOL 551. PLANT PHYSIOLOGY. Class 3, cr. 3. Prerequisites: BIOL 320, 321.

Photosynthesis, mineral nutrition, nitrogen metabolism, water relations, respiration, and growth. Emphasis on quantitative aspects and current literature.

BIOL 552. LABORATORY IN PLANT PHYSIOLOGY. Lab. 4, cr. 2. Prerequisite or corequisite: BIOL 551, unless by consent of instructor.

BIOL 560. PLANT STRUCTURE. Class 4, cr. 4. Prerequisite: BIOL 108 or equivalent or one year of life science.

All major plant groups are studied in an intensive investigation of structure as related to function and classification. Students learn and apply techniques of tissue preparation for microscopic observation and cytochemical analysis.

BIOL 561. IMMUNOLOGY. Class 3, cr. 3.

Introduction to the basic principles of immunology and serology in the molecular, cellular, and organismal level.

BIOL 566. DEVELOPMENTAL BIOLOGY. Class 3, Lab. 3, cr. 4. Prerequisites: one year of life science.

Principles of development of plants and animals; the formation of organ systems.

BIOL 574. PLANT TAXONOMY. Class 2, Lab. 4, cr. 4. Prerequisite: BIOL 108 or equivalent and consent of instructor.

The principles and techniques of identification and classification of vascular plants, consideration of speciation, evolutionary mechanisms, and phylogenetic systems. Laboratory and field work pertaining to the principles and techniqes of plant taxonomy.

BIOL 575. SYSTEMATIC BIOLOGY. Class 2, cr. 2. Prerequisites: BIOL 285, 541, 580 or equivalents or by consent of instructor.

Principles of phylogenetic relationships and techniques used for their determination; classification, speciation theory, multi-method analyses. Evolutionary mechanisms and dynamics; hybridization, breeding systems, displacement phenomena, coevolutionary adaptations, rates of evolution.

BIOL 576. LABORATORY IN SYSTEMIC BIOLOGY. Lab. 4, cr. 2. Corequisite: BIOL 575.

Comparative morphometric, cytogenetic, and biochemical analyses of natural variation within and among populations of single and related species; local and geographic differentiation, introgressive, hybridization, and reproductive ecologies and isolation.

BIOL 580. EVOLUTION. Class 3, cr. 3. Prerequisite: one year of life science.

A study of evolution as a basic concept of the biological sciences; an examination of current methods of experimentation within the area, as well as evidences for and possible mechanisms of evolutionary change.

BIOL 587. BIOGEOGRAPHY. Class 3, cr. 3. Prerequisites: BIOL 285, 580, or consent of instructor.

An introduction to the principles of biogeography. Distribution patterns, the role of history, the interactions of genetics and ecology in development of the species range, the species equilibrium theory, and the evolutionary biogeography of communities and regional biotas.

BIOL 588. PLANT ECOLOGY. Class 2, cr. 2. Prerequisite: BIOL 108 or equivalent.

The physico-chemical and biotic environment affecting plants in nature; the dynamics of plant communities; ecological methods. Applications to agronomy, forestry, wildlife management, outdoor recreation, and other land-use interests.

BIOL 589. LABORATORY IN PLANT ECOLOGY. Lab.4, cr. 2. Prerequisite or corequisite: BIOL 588.

Class field trips and laboratory exercises.

BIOL 591. COMMUNITIES AND ADAPTATIONS. Class 2, Lab. 4. (Saturday lab; several all-day Saturday and two weekend field trips), cr. 4. Must be preceded by BIOL 585 and 586, STAT 503, or equivalent. Students should also possess familiarity with calculus and linear algebra.

A study of interactions which influence distribution and abundance of organisms and the theory which attempts to account for observed patterns in populations, communities, and ecosystems; adaptive strategies of organisms to

interactions with other organisms and their environments. Emphasis on field studies and techniques and methods of sampling in aquatic and terrestrial communities.

BIOL 593. ETHOLOGY. Class 3, Lab. 3, cr. 4.

Animal behavior is analyzed in natural and experimental situations. Emphasis is on the observation of wild and domesticated animals. The effect of early experience, motivation, physiological mechanisms, adaptiveness and the evolution of behavior are considered.

BIOL 595. SPECIAL ASSIGNMENTS. Cr. 1-4

Special work, such as directed reading, independent study or research, supervised library, laboratory, or field work, or presentation of material not available in the formal courses of the department. The field in which work is offered will be indicated in the student's record. Required for M.S. candidates in the non-thesis option. May be repeated for credit.

DEPARTMENT OF CHEMISTRY AND PHYSICS

H. Roland Heydegger, Head

FACULTY: A. H. Carlson, H.D. Fayle (Emeritus), P.V. Flannery (Emeritus), R.R. Fryer, L.C. Gibson, P.D. Gupta, S.K. Gupta, H.R. Heydegger, G.R. Mitchell, V. Namias, N.K. Nelson, J. Pan, J.R. Phillips, T.J. Phillips, A.K. Roebuck (Emeritus), F. Susienka, M. Svonavec, N.D. Yaney

Bacalaureate degree students may select among several program options within the chemistry major or physics major. Each of these programs is described in detail below. In any of these programs, electives may be selected so as to provide a background in pre-medicine, pre-dentistry, pre-pharmacy, pre-law, Technical Administration and Technical Documentation and Information. Details of such programs are available from the departmental office.

Associate degree students may select the five semester program in Chemical Technology also described below.

CHEMISTRY, PHYSICS OR GEOSCIENCES AS A PRIMARY OR SECONDARY TEACHING AREA

The plans of study are designed for prospective secondary school teachers who wish to use a physical science as a primary teaching area. Such students must complete the requirements for certification imposed by the state in which they expect to teach. Students should consult a science education advisor for details.

GENERAL EDUCATION REQUIREMENTS

(a) Total Hours — A student must complete a total of 124 semester hours. An average of 15.5 hours per semester is sufficient to accumulate 124 hours in eight semesters. Students with a graduation index less than 5.0 are advised not to take more than 17 hours in any one semester.

(b) English Composition — One year of English composition (or ENGL 103 entered by achievement examination and completed with a grade of C or better) and successful completion of the ENGL 104 exit examination. Students who complete ENGL 104 with a grade of A may, with the permission of the 104 instructor, substitute any literature or writing course for ENGL 105 but must pass the ENGL 105 exit examination.

(c) Mathematics — A student who completes the specialized requirements for the chemistry and physics programs will automatically satisfy the general education requirement in mathematics.

(d) Laboratory science other than chemistry or physics — A student is required to take at least two courses (preferably a two semester sequence) in a different science such as biology or geoscience. With permission of the Head of the Department, a student may partially fulfill the laboratory science requirement by taking no more than two computer science or engineering courses.

(e) Humanities, social sciences and behavioral sciences. — There are three areas of study in this requirement:

(1) literature, philosophy and creative arts

(2) history and political science

(3) economics, sociology and psychology

The minimum requirement is 18 credits chosen from the above three areas as follows:

(a) A two course sequence from (1), (2), or (3) above.

(b) Any two courses (not necessarily a sequence) from an area not chosen in (a).

(c) Any other two courses from any of the areas (1), (2), or (3).

The three choices outlined above will give the student the required six credits in each of two (out of the three) areas, including one coherent two-course sequence.

CHEMISTRY DEGREE SPECIAL REQUIREMENTS

Bachelor of Science in Chemistry Degree

This degree program is designed primarily for students planning to go on to graduate study or preparing for an industrial career as a chemist. The program at Purdue Calumet is certified by the American Chemical Society. Graduates of this program will be recommended to the American Chemical Society as having fulfilled the requirements of the ACS Committee on Professional Training.

Bachelor of Science Degree

(Chemistry major or chemistry primary teaching area)

This degree program contains the same basic courses in chemistry as the B.S. in Chemistry degree program but has fewer further requirements and permits more electives from other areas. It is recommended that students build a program of study from another area to complement this basic chemistry program. Several options available to students in this program (as well as to students in the B.S. degree in Chemistry) are pre-medicine, pre-dentistry, pre-pharmacy, pre-law, and Technical Administration.

The chemistry courses in this degree program exceed the Indiana certification requirements for a secondary-school primary teaching area in chemistry.

The following courses are required for both the B.S. in Chemistry degree and the B.S. degree (Chemistry Major):

	Credits
General Chemistry (115, 116, 220)	11
Organic Chemistry (261, 262, 265, 266)	10
Physical Chemistry (373, 374, 376)	8
Quantitative Analysis (321)	4
Inorganic Chemistry (342)	3
Mathematics (163, 164, 261)	14
Physics (152, 251)	9
Total	59

Additional requirements for the B.S. in Chemistry degree:

Instrumental Analysis (424)	4
Chemical Literature (513)	1
Advanced Chemistry electives	6
Mathematics (262)	4
Modern Physics (342, 343)	4
Total	19

A reading knowledge of German at passing level for the fourth semester of college (GER 244) must be demonstrated by passing the course or equivalency examination.

PLAN OF STUDY

FRESHMAN YEAR

First Semester

(4) CHM 115 (General Chemistry)
(3) ENGL 104 (English Composition I)
(5) MA 163 (Integrated Calculus and Analytic Geometry I)
(3)Humanities Elective

(15)

Second Semester

(4) CHM 116 (General Chemistry)
(3) ENGL 105 (English Composition II)
(5) MA 164 (Integrated Calculus and Analytic Geometry II)
(3) Humanities Elective

(15)

SOPHOMORE YEAR

Third Semester

(3) CHM 220 (General Chemistry)
(3) CHM 261 (Organic Chemistry)
(2) CHM 265 (Organic Chemistry Laboratory)
(4) MA 261 (Multivariate Calculus)
(4) PHYS 152 (Mechanics and Sound)

(16)

Fourth Semester

(3) CHM 262 (Organic Chemistry)
(2) CHM 266 (Organic Chemistry Laboratory)
(4) MA 262 (Linear Algebra and Differential Equations)
(5) PHYS 251 (Heat, Electricity, and Optics)
(3) Humanities Elective

(17)

JUNIOR YEAR

Fifth Semester

(4) CHM 321 (Analytical Chemistry I)
(3) CHM 373 (Physical Chemistry)
(3) PHYS 342 (Modern Physics)
(1) PHYS 343 (Modern Physics Laboratory)
(3) GER 101 (First course in German)
(3) Humanities Elective

(17)

Sixth Semester

(3) CHM 374 (Physical Chemistry)
(2) CHM 376 (Physical Chemistry Laboratory)
(1) CHM 513 (Chemical Literature)
(3) GER 102 (Second course in German)
(6) Humanities Elective

(15)

SENIOR YEAR

Seventh Semester

(3) CHM 342 (Inorganic Chemistry)
(3) GER 203 (Third course in German)
(3) Chemistry elective
(3) Science Elective
(3) Humanities Elective

(15)

Eighth Semester

(4) CHM 424 (Analytical Chemistry II)
(3) GER 244 (Fourth course in scientific German)
(3) Chemistry elective
(3) Science elective
(3) Humanities Elective

(16)

PHYSICS DEGREE SPECIAL REQUIREMENTS

Bachelor of Science Degree (Physics major or Physics primary teaching area)

The Department of Chemistry and Physics at Purdue Calumet offers a program leading to the Bachelor of Science degree with a physics major.

The program is intended to be suitable for students with a wide variety of interests, including those desiring a broad general education together with specialization in physics. It gives an excellent background for advanced study at the physics graduate schools, while electives are offered so that the student with an immediate goal of industrial, institutional or governmental employment may select emphasis in Pure Physics, Applied Physics, Biophysics or Technical Management. The biophysics option is similar to a pre-med program and meets the entrance requirements of many medical and dental schools.

The physics courses in this degree program exceed the Indiana Certification requirements for a secondary school primary teaching area in physics.

In order to receive a physics degree, a student must maintain a grade-point average of 4.0 or above in all physics courses. Students will be allowed to transfer from other fields to a major in physics only if they have a grade point average of 4.0 in all physics and mathematics courses completed up to that time and have received a grade below C in not more than one such course.

	Credits
Courses required for the Physics major degree are:	
General Physics (152, 251)	9
Intermediate Mechanics (310)	4
Oscillations and Waves (322)	3
Intermediate Electricity and Magnetism (330)	3
Intermediate Laboratory (350, 351)	4
Modern Physics and Laboratory (342, 343)	4
Thermodynamics (515)	3
Quantum Mechanics (550)	3
Mathematics (163, 164, 261, 262)	18
Advanced Mathematics, Statistics or Computer Science	6
Chemistry (115, 116)	8
	65

Students planning to enter graduate school are advised to take two years of a modern foreign language as part of their free electives.

Typical Plan of Study

The sample program indicates as "electives" those courses needed to complete general degree requirements and free electives. "Free" electives would be chosen to tailor the program toward a particular career option. It should be noted that the program provides for a minor in mathematics as well as a major in physics and also easily accomodates a major in mathematics as well through proper selection of electives (details are available from a Mathematics advisor).

FRESHMAN YEAR

First Semester	Second Semester
(5) MA 163 (Integrated Calculus and Analytic Geometry I)	(5) MA 164 (Integrated Calculus and Analytic Geometry II)
(3) ENGL 104 (English Composition I)	(4) PHYS 152 (Mechanics)
(4) CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(3) Electives	(3) ENGL 105 (English Composition II)
(15)	(16)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(4) MA 261 (Multivariate Calculus)	(4) MA 262 (Linear Algebra and Differential Equations)
(5) PHYS 251 (Heat, Electricity, and Optics)	(3) PHYS 342 (Modern Physics)
(6) Electives	(1) PHYS 343 (Modern Physics Laboratory)
	(9) Electives
(15)	(17)

JUNIOR YEAR

Fifth Semester

(4) PHYS 310 (Intermediate Mechanics)
(3) PHYS 322 (Oscillations and Waves)
(2) PHYS 350 (Intermediate Laboratory)
(3) Mathematics elective
(6) Electives
—
(18)

Sixth Semester

(3) PHYS 330 (Intermediate Electricity and Magnetism)
(2) PHYS 351 (Intermediate Laboratory II)
(3) Mathematics elective
(9) Electives
—
(17)

SENIOR YEAR

Seventh Semester

(3) PHYS 550 (Introduction to Quantum Mechanics)
(12) Electives
—
(15)

Eighth Semester

(3) PHYS 515 (Thermodynamics)
(12) Electives
—
(15)

ASSOCIATE IN APPLIED SCIENCE DEGREE IN CHEMICAL TECHNOLOGY

This five semester college-level program in chemical technology is designed to train persons for employment in the chemical and allied products industries. This training will enable the technician to assist a chemist, chemical engineer, or plant supervisor to develop procedures, make technical measurements, develop research models and operate a chemical process or plant. Upon successful completion of the program the degree of Associate in Applied Science will be granted.

Two options are available: the general industrial option and the pharmaceutical option. In the Calumet region of Indiana and Illinois greater opportunities are presented to those choosing the general industrial option. The person who has chosen the pharmaceutical option will find ample opportunities for employment in the greater Chicago, Indianapolis and South Bend-Elkhart areas. At present, the demands for chemical technicians far exceed the supply. Each year many companies come to Purdue Calumet seeking qualified chemical technologists.

General Industrial Option

First Semester

(3) CHM 111 (General Chemistry)
(3) COM 114 (Fundamentals of Speech Communication)
(3) ENGL 104 (English Composition I)
(3) MA 147 (Algebra and Trigonometry)
—
(12)

Second Semester

(3) CHM 112 (General Chemistry)
(3) CIS 100 (Computer Utilization)
(3) MA 148 (Algebra and Trigonometry II)
(3) ENGL 220 (Technical Report Writing)
—
(12)

Third Semester

(4) CHM 251 (Organic Chemistry)
(1) CHM 252 (Organic Chemistry Laboratory)
(4) CHM 223 (Qualitative Analysis)
(3) MA 221 (Calculus for Technology I)
(4) PHYS 218 (General Physics)

—
(16)

Fourth Semester

(4) CHM 224 (Intro. Quantitative Analysis)
(3) CHM 273 (Introduction to Physical Chemistry)
(3) MA 222 (Calculus for Technology II)
(4) PHYS 219 (General Physics)

—
(14)

Fifth Semester

(3) CHT 201 (Unit Operations)
(2) CHT 202 (Individual Projects)
(4) CHT 225 (Quantitative Analysis — Instrumental)
(3) SPV 252 (Human Relations in Industry)

—
(12)

Pharmaceutical Option

Students pursuing this option will substitute BIOL 101, BIOL 102, CHM 219, for CIS 100, CHT 201, CHT 202 which are required for those pursuing the General Industrial Option.

CHEMISTRY

UNDERGRADUATE LEVEL

CHM 111. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3. Open to all students not qualified for CHM 115.

CHM 112. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3. Prerequisite: CHM 111 or equivalent.

Continuation of CHM 111.

CHM 115. GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4. Required of students majoring in chemistry, physics, and engineering.

Laws and principles of chemistry, with special emphasis on topics of importance in science and engineering. Numerical problems and relationships are introduced whenever quantitative treatment is possible.

CHM 116. GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4. Prerequisite: CHM 115 or equivalent.

A continuation of CHM 115.

CHM 119. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3. (offered only in the Nurses' Training Program.)

A survey of general, organic, and biological chemistry. Intended primarily for students in the nursing program but may be taken by others with the consent of the instructor.

CHM 131. CHEMISTRY AND ECOLOGY. Class 2, Lab. 3, cr. 3.

An introduction to the application of chemical principles to the world around us (our environment). It may be used in satisfaction of the physical science requirement for the School of Humanities. Education and Social Sciences.

CHM 132. CHEMISTRY AND ECOLOGY. Class 2, Lab. 3, cr. 3. Prerequisite: CHM 131 or equivalent.

A continuation of CHM 131.

CHM 219. INTRODUCTION TO BIOCHEMISTRY. Class 2, Lab. 3, cr. 3. Prerequisite: CHM 119 or CHM 112 or CHM 116 or equivalent.

A survey of modern biochemistry. Emphasis will be on the structure of biomolecules, biochemical reactions related to human metabolic processes and metabolic interrelationships. Open to all students.

CHM 220. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3. Prerequisite: CHM 116. Prerequisite or corequisite: MA 163 or equivalent. Required of students who have completed CHM 115 and 116 and who are planning to take CHM 373 or CHM 321.

A consideration of certain principles of general and analytical chemistry which are not covered in CHM 115 and 116. This course is designed to bridge the gap between the course sequences CHM 115-116 and 117-126.

CHM 223. INTRODUCTORY QUALITATIVE ANALYSIS. Class 2, Lab. 6, cr. 4. Prerequisite: CHM 112 or 116.

Introduction to semimicro qualitative analysis.

CHM 224. INTRODUCTORY QUANTITATIVE ANALYSIS. Class 2, Lab. 6, cr. 4. Prerequisite: CHM 112 or 116. Required of students majoring in biology who do not take CHM 321.

Introduction to titrimetric, gravimetric, and instrumental methods of analysis.

CHM 251. ORGANIC CHEMISTRY. Class 4, cr. 4. Prerequisite: CHM 112 or 116.

Introductory organic chemistry for students not expecting to take biochemistry. Emphasis on natural products, biochemical materials, and the theoretical principles relating the structures with the properties of organic compounds.

CHM 252. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1. Corequisite: CHM 251 or equivalent.

Laboratory experiments to accompany CHM 251.

CHM 254. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1. Prerequisite or corequisite CHM 255 or equivalent.

Laboratory experiments to accompany CHM 255.

CHM 255. ORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 112 or 116.

A study of aliphatic and aromatic hydrocarbons and their simple derivatives in terms of (a) structure, bonding, etc., (b) general syntheses and reactions, and (c) a logical modern rationale for fundamental phenomena as supported by reactivity orders, orientation effects, stereochemistry, and relative rates.

CHM 256. ORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 255 or equivalent.

Continuation of CHM 255.

CHM 258. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1. Corequisite: CHM 256 or equivalent.

Laboratory experiments to accompany CHM 256.

CHM 261. ORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 116 or equivalent.

A comprehensive study of the chemical principles underlying aliphatic and aromatic compounds. Emphasis is placed on the commercial and laboratory syntheses of these materials as well as their uses. Modern theory and stereochemistry are stressed to illustrate the logic inherent in the subject matter and to demonstrate the predictability of many of the chemical transformations discussed.

CHM 262. ORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 261 or equivalent.

A continuation of CHM 261, but with a broader scope. The chemistry of a variety of functional groups is discussed. Theory is employed extensively to demonstrate the coherence underlying seemingly diverse transformations. Guest speakers, renowned for their research contributions to certain of the subjects discussed, present a limited number of lectures on these topics.

CHM 263. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1. Corequisite: CHM 261 or equivalent.

Laboratory experiments designed to illustrate the lecture material of CHM 261. Elementary laboratory techniques essential to organic chemistry are introduced followed by the actual synthesis and purification of compounds discussed in CHM 261.

CHM 264. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1. Corequisite: CHM 262 or equivalent.

A continuation of CHM 263 in that the experiments are designed to illustrate principles discussed in CHM 262. A major portion of the course is devoted to methods employed in organic qualitative analysis. The student is expected to identify several "unknown" compounds and mixtures.

CHM 265. ORGANIC CHEMISTRY LABORATORY. Lab. 6, cr. 2. Corequisite: CHM 261 or equivalent.

Similar to CHM 263 except that a larger number and more sophisticated organic syntheses are required. The preparations are designed, not only to illustrate the classical reactions discussed in CHM 261, but to allow for an extrapolation of the principles involved to other systems.

CHM 266. ORGANIC CHEMISTRY LABORATORY. Lab. 6, cr. 2. Corequisite: CHM 262 or equivalent.

A continuation of CHM 265. All experiments are designed to illustrate the principles discussed in CHM 262. A major portion of the course is devoted to the methods employed in organic qualitative analysis. The student is expected to identify "unknowns" and mixtures and is introduced to some modern instrumental techniques.

CHM 273. INTRODUCTORY PHYSICAL CHEMISTRY. Class 3, cr. 3. Prerequisites: MA 222 or equivalent and CHM 112 or equivalent.

An introductory treatment of the general properties of gases, with an emphasis on applications of physical chemistry in real systems, liquids and solids. This course may be used by premedical, predental, biology and technology students.

CHM 321. ANALYTICAL CHEMISTRY I. Class 2, Lab. 6, cr. 4. Prerequisites: CHM 126 or 220 and one year of organic chemistry. Required of students majoring in chemistry.

Quantitative measurements on complex chemical systems that show matrix effects or require isolation of a component prior to its determination; general approaches to quantitation problems at the trace level; critical comparisons of competitive procedures with emphasis upon principles of separation processes, including chromatography; recognition and evaluation of possible sources of error; approaches for optimizing conditions so as to minimize time and/or effort required to attain prescribed levels of accuracy and precision.

CHM 342. INORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite or corequisite: CHM 374.

Interpretation and correlation of inorganic reactions.

CHM 343. INORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1. Corequisite: CHM 342 or equivalent.

Laboratory work to accompany CHM 342.

CHM 373. PHYSICAL CHEMISTRY. Class 3, cr. 3. Prerequisites: CHM 126 or 220, MA 261, and two semesters of college physics.

Properties of gases; kinetic molecular theory; introduction to atomic and molecular structure; classical thermodynamics, including chemical equilibria, molecular interpretation of thermodynamics.

CHM 374. PHYSICAL CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 373.

Phase equilibria, liquids, electrolytic solutions and cells, structure of atoms and molecules, spectroscopy, chemical kinetics, and solid state.

CHM 376. PHYSICAL CHEMISTRY LABORATORY. Lab. 6, cr. 2. Corequisite: CHM 374 or equivalent

Laboratory portion of CHM 373 and 374.

CHM 424. ANALYTICAL CHEMISTRY II. Class 2, Lab. 6, cr. 4. Prerequisite: CHM 321; prerequisite or corequisite: CHM 374.

Principles and application of optical and eletrical methods of chemical anaylsis, including topics in instrumentation.

CHM 444. COSMOCHEMISTRY. Class 3, cr. 3. Prerequisite or corequisite: CHM 374 or consent of instructor.

Nucleosynthesis and chemical abundances. Origin, composition, and structure of the earth and extraterrestrial objects. Isotope geology, geo-and cosmo-chronology with particular emphasis upon the moon and meteorites.

CHM 499. SPECIAL ASSIGNMENTS. Lab. 3 to Lab. 15, cr. 1-5.

Undergraduate level special work, such as a senior thesis, not included in other courses.

DUAL LEVEL
Undergraduate-Graduate

CHM 513. CHEMICAL LITERATURE. Class 1, cr. 1.

Types of information in technical publications; exercises in finding, assembling and using such data.

CHM 533. INTRODUCTORY BIOCHEMISTRY. Class 3, cr. 3. Prerequisites or corequisites: CHM 256 or equivalent.

Chemistry and utilization in the living organisms of lipids, carbohydrates, proteins, enzymes, and hormones; physiological chemistry of the blood, urine and other fluids and tissues; essentials of nutrition.

CHM 534. INTRODUCTORY BIOCHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 533 or equivalent.

Continuation of CHM 533 with emphasis on enzymatic catalysis and metabolic transformations.

CHM 535. BIOCHEMISTRY LABORATORY. Lab. 3, cr. 1. Corequisite: CHM 534 or equivalent.

Laboratroy work to accompany CHM 533.

CHM 548. RADIOCHEMISTRY. Class 2, cr. 2. Prerequisite: CHM 374 or equivalent.

Elements of nuclear chemistry; the uses of isotopes in chemical research; elementary principles of radiation chemistry.

CHM 549. RADIOCHEMISTRY LABORATORY. Lab. 3, cr. 1. Prerequisite or corequisite: CHM 548.

Laboratory work to accompany CHM 548.

CHM 563. ORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 262 or equivalent.

Ionic and free radical reactions are discussed critically with emphasis on the synthetic and mechanistic aspects of the reactions studied. Selected topics in physical organic chemistry.

CHM 599. SPECIAL ASSIGNMENTS. Cr. 1-3. Prerequisite: Consent of instructor.

Graduate level directed reading or special work not included in other courses.

CHEMICAL TECHNOLOGY

UNDERGRADUATE LEVEL

CHT 201. UNIT OPERATIONS I. Class 3, cr. 3. Prerequisites: MA 148 or equivalent and CHM 112 or equivalent.

This course will acquaint the student with chemical process equipment, its use, and its applications. It focuses study on the principles, materials, systems of equipment, and some of the problems involved in chemical manufacturing processing. Chemical plant operations such as filtration, evaporation, drying cyrstallization, solvent extraction, distillation and fluid handling are described and discussed.

CHT 202. INDIVIDUAL PROJECTS IN CHEMICAL TECHNOLOGY. Lab. 6, cr. 2. Prerequisite or corequisite: CHT 225.

Each student will complete a project requiring the use of the library for research and laboratory to carry out the project. A written report of the project is required.

CHT 225. INSTRUMENTAL QUANTITATIVE ANALYSIS. Class 3, Lab. 3, cr. 4. Prerequisites: CHM 224, CHM 273.

An introduction to instrumental methods of analysis. Emphasis is placed on applications rather than design of instruments.

GEOSCIENCES

UNDERGRADUATE LEVEL

GEOS 100. FRONTIERS IN GEOSCIENCES. Class 3, cr. 3. Recommended for both science and nonscience students.

A description of the combination of physical processes, natural laws, and interactions with man which serve to influence the changing character of the earth and its neighbors in space. A survey of current efforts by geoscientists to expand their understanding of man's environment.

GEOS 220. SURVEY OF PHYSICAL GEOGRAPHY. Class 2, Lab. 3, cr. 3.

A study of landforms, climates, soils, and resources that comprise the world's natural environments; includes the elements of cartography and geodetic measurements.

GEOS 361. INTERMEDIATE ASTRONOMY I. Class 3, cr. 3. Perequisite or corequisite: PHYS 251, MA 162, or consent of instructor.

Intermediate level introduction to solar system, astronomical instruments, radio astronomy, celestial mechanics, and space research for science students.

GEOS 362. INTERMEDIATE ASTRONOMY II. Class 3, cr. 3. Prerequisite or corequisite: PHYS 251, MA 162, or consent of instructor.

Intermediate level introduction to stellar astronomy and astrophysics, including physical properties of stars and sun, variable stars, pulsars, Milky Way galaxy, external galaxies, quasars, and cosmology.

PHARMACOLOGY

UNDERGRADUATE LEVEL

PCTX 201. INTRODUCTORY PHARMACY. Class 3, cr. 3.

An introduction to the pharmacological basis of therapeutics for nursing students. Included are the study of the prescription, weights and measures, nomenclature, posology, dosage forms, therapeutic classifications and modes of administration. Factors which modify drug action will be discussed as well as contra-indications and drug reactions and their treatment.

PHYSICS

UNDERGRADUATE LEVEL

PHYS 107. CONCEPTUAL PHYSICS FOR HUMANITIES. Class 3, cr. 3.

A descriptive, non-mathematical explanation of physical laws and theories, phenomena and practical applications. Topics: mechanics, properties of matter, heat and waves.

PHYS 108. CONCEPTUAL PHYSICS FOR HUMANITIES. Class 3, Cr. 3.

A descriptive, non-mathematical explanation of physical laws and theories, phenomena and practical applications. Topics: Electricity, magnetism, light, and modern physics.

PHYS 152. MECHANICS. Class 4, Lab. 2, cr. 4. Prerequisite or corequisite: MA 164 or equivalent.

Statics, uniform and accelerated motion; Newton's laws; circular motion; energy, momentum, and conservation principles; dynamics of rotation; gravitation and planetary motion; hydrostatics and hydrodynamics; simple harmonic motion and wave motion.

PHYS 210. THE NATURE OF PHYSICAL SCIENCE I. Class 2, Lab. 3, cr. 3.

Development of basic concepts and theories in physical science; a terminal course.

PHYS 211. THE NATURE OF PHYSICAL SCIENCE II. Class 2, Lab. 3, cr. 3. Prerequisite: PHYS 210 or equivalent.

Continuation of PHYS 210. PHYS 210 and 211 will satisfy the physical science requirement in the School of Humanities, Education, and Social Sciences.

PHYS 218. GENERAL PHYSICS. Class 4, Lab. 2, cr. 4. Prerequisities: MA 150 or 111 and 112.

Mechanics, heat, and sound, primarily for technology students.

PHYS 219. GENERAL PHYSICS. Class 4, Lab. 2, cr. 4. Prerequisite: PHYS 218.

Electricty, light, and modern physics, primarily for technology students.

PHYS 220. GENERAL PHYSICS. Class 3, Lab. 2, cr. 4. Prerequisite: MA 148 or 154 or equivalent.

Mechanics, heat and sound, for science students not specializing in physics, chemistry, or engineering.

PHYS 221. GENERAL PHYSICS. Class 3, Lab. 2, cr. 4. Prerequisite: PHYS 220.

Electricity, light, and modern physics, for science students not specializing in physics, chemistry, or engineering.

PHYS 251. HEAT, ELECTRICITY, AND OPTICS. Class 5, Lab. 2, cr. 5. Prerequisite: PHYS 152 or equivalent. Corequisite: MA 261 or equivalent.

Heat, kinetic theory, elementary thermodynamics, heat transfer. Electrostatics, current electricity, electromagnetism, magnetic properties of matter; geometrical and physical optics.

PHYS 261. HEAT, ELECTRICITY, AND OPTICS. Class 5, cr. 4. Prerequisite: PHYS 152; prerequisite or corequisite; MA 261 or equivalent.

Heat, kinetic theory, elementary thermodynamics, heat transfer. Eletrostatics, current electricty, electromagnetism, magnetic properties of matter; geometrical and physical optics.

PHYS 270. SPECIAL TOPICS IN PHYSICS. Cr. 1-5. Admission by special permission.

Specialized topics in physics. May be repeated for credit.

PHYS 310. INTERMEDIATE MECHANICS. Class 4, cr. 4. Prerequisite: MA 261 and PHYS 251 or 261 or equivalent.

For students familiar with calculus. Elements of vector algebra; statics of particles and rigid bodies; theory of couples; principle of virtual work; kinematics; dynamics of particles and rigid bodies; work, power, and energy; elements of hydromechanics and elasticity.

PHYS 322. OSCILLATIONS AND WAVES. Class 3, cr. 3. Prerequisite: PHYS 251 or equivalent.

Modes of vibration of a system; emission and absorption of waves; properties of sound, electromagnetic, and particle waves including phenomena of refraction, reflection. dispersion, diffraction, interference, polarization, and double refraction.

PHYS 330. INTERMEDIATE ELECTRICITY AND MAGNETISM. Class 3, cr. 3. Prerequisite: PHYS 251 or equivalent; prerequisite or corequisite: MA 262 or equivalent.

Electrostatics; electric currents; magnetostatics; eletromagnetic induction; Maxwell's equations; electromagnetic waves.

PHYS 342. MODERN PHYSICS. Class 4, cr. 3. Prerequisite: PHYS 251 or 261.

A survey of basic concepts and phenomena in atomic, nuclear, and solid state physics.

PHYS 343. MODERN PHYSICS LABORATORY. Lab. 2, cr. 1. Corequisite: PHYS 342.

Laboratory experiments to accompany PHYS 342.

PHYS 350. INTERMEDIATE LABORATORY I. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: PHYS 322.

Lectures on geometrical optics; instructor demonstrations and student experiments involving mechanical and electromagnetic wave and oscillation phenomena.

PHYS 351. INTERMEDIATE LABORATORY II. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: PHYS 330.

Lectures on AC circuit theory; instructor demonstrations and student experiments involving particle diffraction, wave polarization, double refraction, AC circuits, and meters.

PHYS 352. INTERMEDIATE LABORATORY III. Class 1, Lab. 3, cr. 2. Prerequisites: PHYS 342 and 351.

Lectures and experiments on electromagnetic waveguides for wavelengths from the microwave to radio region, photoelectric effect, energy levels in atoms, magnetic susceptibility. Compton effect, nuclear line spectra, nuclear magnetic resonance.

PHYS 470. SPECIAL TOPICS IN PHYSICS. Cr. 1-5. Admission by special permission. May be repeated for credit.

DUAL LEVEL
Undergraduate-Graduate

PHYS 500. FUNDAMENTAL PHYSICS I. Class 1, Lec. Dem. 2, cr. 2. Prerequisite: a course in college physics. Admission by consent of instructor.

A review of mechanics, wave motion and kinetic theory and the extensions of the laws in these domains to relativity and current investigations and applications. The course is specifically designed for teachers of science in the secondary schools.

PHYS 501. PHYSICAL SCIENCE I. Class 3, cr. 3. Prerequisite: a course in college physics.

A survey of the physical sciences with emphasis on the overlap of astronomy, physics, chemistry, and geophysics. Consideration of appropriate methods of presentation and demostration of experiments in physical science for the elementary school.

PHYS 502. PHYSICAL SCIENCE II. Class 3, cr. 3. Prerequisite: PHYS 501 or consent of instructor.

A continuation of PHYS 501 with emphasis on electricity, optics and modern physics.

PHYS 503. FUNDAMENTAL CONCEPTS OF PHYSICS. Class 3, cr. 3. Prerequisite: a course in college physics. Admission by consent of instructor.

An intensive review of the principles of physics specifically designed for teachers of the physical sciences in high school. Special emphasis will be placed on mechanics, kinetic theory, electric and magnetic fields, and the propagation of eletromagnetic radiation.

PHYS 504. PRINCIPLES OF PHYSICS I. Class 2, cr. 2. Prerequisites: college physics and mathematics through calculus.

A review of classical physics, with emphasis on the unifying principles operating in the various domains. Stress will be placed on the operational approach, the conversation principles, and the field theory law of gravitation and electromagnetism. Designed primarily for secondary school teachers.

PHYS 506. FUNDAMENTAL PHYSICS II. Class 1, Lec. Dem. 2, cr. 2. Prerequisite: PHYS 500 or equivalent.

An intensive review of electricity, magnetism and light, and an introduction to quantum phenomena and atomic and nuclear structure. The course is specifically designed for teachers of science in the secondary schools.

PHYS 508. INTRODUCTION TO THEORETICAL PHYSICS I. Class 3, cr. 3. Prerequisite or corequisite: PHYS 504.

Vector algebra and calculus; dynamics of particles and rigid bodies; gravitation and planetary motion; oscillations and waves; thermodynamics. Designed primarily for secondary school teachers.

PHYS 509. INTRODUCTION TO THEORETICAL PHYSICS II. Class 3, cr. 3. Prerequisite: PHYS 508 or equivalent.

Kinetic theory and statistical mechanics; electromagnetism and Maxwell's equations; physical optics; wave mechanics. Designed primarily for secondary school teachers.

PHYS 510. PHYSICAL MECHANICS. Class 3, cr. 3. Prerequisites: PHYS 310 or equivalent. PHYS 330 or equivalent, and MA 262 or equivalent.

Mechanics of particles, rigid bodies, and vibrating systems; elasticity and hydrodynamics; theory of relativity.

PHYS 515. THERMODYNAMICS. Class 3, cr. 3. Prerequisite: PHYS 310 and 330 and MA 262 or equivalent.

Fundamental concepts of heat; theory and practice of heat measurments; first and second laws of thermodynamics, with applications.

PHYS 517. STATISTICAL PHYSICS. Class 3, cr. 3. Prerequisites: PHYS 342, 510, and 515 or equivalent.

Kinetic theory of gases, third law of thermodynamics, and the principles of statistical mechanics, with applications to the quantum theory of radiation and the theory of specific heats.

PHYS 530. ELECTRICITY AND MAGNETISM. Class 3, cr. 3. Prerequisite: PHYS 330 or equivalent.

An introductory theoretical course. Vector analysis; electrostatic problems; theory of dielectrics; theory of conduction; thermoelectric and photoelectric phenomena; electromagnetic effects due to steady and changing currents; magnetic properties of matter; Maxwell's equations; radiation.

PHYS 542. SURVEY OF MODERN PHYSICS I. Class 3, cr. 3. Prerequisites: general physics and calculus. Restricted for graduate credits to candidates in education or science teaching.

Elementary particles. Relativity. Quantum theory. Atomic spectra and X-rays. Pauli principle. Wave mechanics. Radiation and statistics.

PHYS 545. SOLID STATE PHYSICS. Class 3, cr. 3. Prerequisite: PHYS 550 or equivalent.

Crystal structure; lattice vibrations and electronic band structure of crystals; electrical, optical, and thermal properties of solids; transport and other nonequilibrium phenomena in uniform and nonuniform materials.

PHYS 549. SURVEY OF MODERN PHYSICS II. Class 3, cr, 3. Prerequisite: PHYS 542 or equivalent.

Solid state physics; nuclear particles and forces; natural and artificail radioactivity; particle

accelerators; nuclear reactions; fission and fusion. Designed primarily for secondary school teachers.

PHYS 550. INTRODUCTION TO QUANTUM MECHANICS. Class 3, cr. 3. Prerequisites: PHYS 310 or 330, and 342, MA 302 or 501, or equivalent.

Brief historical survey of the development of quantum mechanics; waves in classical physics, wavepackets, uncertainty principle, wave functions, operators, expectation values of dynamical observables: Schrodinger equation with application to one-dimensional problems, the hydrogen atom; electron spin, periodic table; selected topics in perturbation theory, scattering theory and compounding of angular momenta. Designed for students needing quantum mechanics background for specialty courses such as PHYS 545, 556, and 564.

PHYS 564. INTRODUCTION TO ELEMENTARY PARTICLE PHYSICS. Class 3, cr. 3. Prerequisite: PHYS 550 or 552 or equivalent.

Historical survey of the discovery of elementary particles. Methods of detecting charged particles. Modern particle accelerators. Kinematics and quantum mechanics of scattering and decay of particles; conservation of four-momentum and angular momentum; phase space. Charge structure of particles; form factors. Strong interactions; resonances in pion-nucleon and pion-pion systems; effective mass, Dalitz, and Chew-Low plots; qualitative introduction to Feynman diagram techniques in single particle exchange processes; T, C, P, invariance; isospin; strangeness, G-Parity; Gell-Mann Nishijima formula. Electromagnetic and weak interactions; violation of strong interaction symmetries, interpretation of particle spectra in terms of SU (3) symmetry, the quark model and Regge theory.

PHYS 566. INTRODUCTORY NUCLEAR PHYSICS. Class 3, cr. 3. Prerequisite: PHYS 550 or equivalent.

Theory of relativity, brief survey of systematics of nuclei and elementary particles, structure of stable nuclei, radioactivity, interaction of nuclear radiation with matter, nuclear reactions, particle accelerators, nuclear instruments, fission, nuclear reactors.

PHYS 590. READING AND RESEARCH. Cr. 1-3.

DEPARTMENT OF MATHEMATICAL SCIENCES

Paul Gordon, Head

FACULTY: W.J. Barlow, R.D. Bechtel, T.S. Chihara, D.L. Clark, J.E. Forbes, P. Gordon, R.J. Hill, H. Hosek, B.L. Jahr, L.S. Johnson, W.C. Lordan, J.P. McLaughlin, C.M. Murphy, N. Relich (Emeritus), J.A. Smith, W.A. Stock, (Emeritus), D.J. Troy, H.B. Von Horn, R.J. Wagenblast, R.L. Yates, E.C. Zacher.

Bachelor of Science Degree with majors in Mathematics and Computer Science

The Department of Mathematical Sciences offers mathematics and computer science programs leading to a Bachelor of Science degree. The curriculum is organized in terms of four major options.

1) pure mathematics,
2) applied mathematics,
3) computer science (see special listing),
4) mathematics education for secondary school teachers.

Programs are designed to permit students to select courses suited to a variety of interests and career goals. By the end of the sophomore year, and sooner if possible, the student selects one of the following career goals:

1) university or college teaching,
2) general mathematics major,
3) scientific computer analysis,
4) information systems computer analysis,

5) secondary school teaching,
6) actuarial science
7) operations research,
8) mathematical statistics and applied probability,
9) mathematical physics.

Several of these career goals may be pursued in more than one of the major options.

When entering the Mathematics Department the student is assigned to a faculty member whose role is to aid the student in the selection of courses and in a career choice. After choosing an option and a career combination, the student plans the remainder of his course work with the aid of a faculty advisor specializing in that area.

There are no rigid boundaries among these various career goals (with the possible exception of secondary school teaching, where the student has much less flexibility). In all options, the student will be encouraged to study in a broad range of mathematical disciplines. Much of the difference among curricula will occur with regard to the student's choice of a minor area of concentration.

The practicum in applied mathematics, MA 480 (CS 480), is a unique feature of the mathematics program. The practicum consists of a small group of students working under the direction of a faculty member. A problem for this team will be obtained by the faculty advisor in conjunction with a local business or industry. At least one term (three credits) of the practicum is required of all mathematics students, except those in the pure mathematics option. The course is recommended for students in the pure mathematics option, but is not required. Students in the secondary school teaching option may use student teaching to fulfill this requirement. It is expected that the practicum will be taken during the senior year. Not more than two terms of practicum may be taken for credit.

GENERAL DEGREE REQUIREMENTS

The general requirements for a B.S degree in the Mathematical Sciences are as follows:

1. A total of 124 semester hours of credit. Mathematics courses numbered below MA 163 may not be included in this total.
2. English Composition. ENGL 104 and 105 are required or placement into ENGL 103 with a grade of C or better. A student who has received a grade of A in ENGL 104 may, with the approval of his 104 instructor, substitute for ENGL 105 an elective course in English, usually a 200 level literature course.
3. Humanities, Social Studies, and Behavioral Sciences. This requirement is specified in terms of the following five areas:
    a. literature, philosophy, creative arts.
    b. history, political science.
    c. economics.
    d. sociology, psychology.
    e. foreign language.

    The minimum requirement is 30 hours, with at least six hours selected from each of at least four of the above five areas.

    In the area of creative arts, only those courses specified as meeting the aesthetics requirements of the School of Humanities, Education, and Social Sciences may be used in meeting this requirement. Other courses in that area may be used as free electives.

4. Science. Students must take at least four courses in laboratory science outside their major area. It is preferable that the student take two-course sequences in each of two sciences. The courses selected should normally be chosen from the areas of Biology, Chemistry, Geosciences, and Physics. However, students may, with the approval of the department, use no more than two courses from Engineering or Information Systems to partially fulfill the laboratory science requirement.
5. Minor requirement — The guiding principle is that the student should acquire some depth of study in a subject other than mathematics. Each student must have a minor program of 18 credit hours outside the department of Mathematical Sciences, including at least three courses beyond the introductory level. Normally, all of the courses for the minor are taken in a single subject, but courses in several related subjects will be acceptable if approved by the student's advisor.
6. Major requirements — the following are required:
   a. The basic calculus sequence: MA 163, MA 164, MA 261
   b. MA 262 and MA 453
   c. CS 220.
   d. Twelve additional hours of approved mathematics, statistics, or computer science courses numbered above 300. The practicum may be included in this total.
   e. A graduation index of at least 4.0 in those courses in the department which are used to fulfill the minimum requirements listed under a, b, c, and d above.

A typical program for the first two years is as follows:

FRESHMAN YEAR

First Semester

(5)MA 163 (Integrated Calculus and Analytic Geometry I)
(3) ENGL 104 (English Composition I)
(3)CS 220 (Programming I)
(3-4)Science elective

(14-15)

Second Semester

(5) MA 164 (Integrated Calculus and Analytic Geometry II)
(3) ENGL 105 (English Composition II)
(3) CS 320 (Programming II)
(3-4) Science elective

(14-15)

SOPHOMORE YEAR

Third Semester

(4) MA 261 (Multivariate Calculus)
(9) Electives in Humanities and secondary area concentration
(3-4)Science elective

(16-17)

Fourth Semester

(4) MA 262 (Linear Algebra and Differential Equations)
(9) Electives in humanities and secondary area concentration
(3-4) Science elective

(16-17)

A Major in Computer Science

Computer Science, a relatively new and still rapidly expanding field, deals with the design and application of computer systems. The curriculm for the Computer Science Major is organized in terms of three options.

1) General Computer Science Option: This option attempts to give a broad background covering various areas of Computer Science. The student interested in graduate work in Computer Science would be best advised to follow this option.
2) Scientific Computing Option: This option is intended for those students who are interested in the use of the computer to analyze and solve engineering and scientific problems.
3) Systems and Programming Option: The emphasis with this option is on the software associated with the operations of Computer Systems.

The Practicum in Computer Science, CS 480, is a unique feature of the program and is required of all students. (See earlier discussion of MA 480).

The General Degree Requirements in terms of total number of credits, English Composition, Humanities, and Science, is the same as given earlier. The minor requirement is fulfilled by the additional CS courses listed below. The major requirements are as follows:

Core requirements in Mathematics, Statistics, and Computer Science for all options:

i)	Mathematics (21 credits)	
	MA 163, MA 164, MA 261 — Calculus	14
	MA 262 — Diff. Eq. & Linear Algebra	4
	MA 352 — Intermediate Linear Algebra	3
ii)	Statistics (3 credits)	
	STAT 516 — Basic Probability and Applications	
iii)	Computer Science (12 credits)	
	CS 220, CS 320 — Programming I & II	6
	CS 300 — Assembly Language Programming	3
	CS 430 — Data Structures	3

Specific requirements for each option:

a)	General Computer Science Option (18 credits)	
	CS 480 — The Practicum in Computer Science	3
	CS 482 — Discrete Computational Structures	3
	CS 484 — Theory of Computation	3
	CS 414 — Intro. to Numerical Analysis	3
	CS 402 — Architecture of Computers	
	or	3
	CS 403 — Systems Programming	
	An approved Math Sciences elective (possible choices: MA 362, MA 453, STAT 512, CS 502, CS 514, CS 515)	3
b)	Scientific Option (18 credits)	
	MA 362 — Advanced Calculus	3
	CS 414 — Introduction to Numerical Analysis	3
	CS 480 — The Practicum in Computer Science	3
	CS 514 — Numerical Analysis	3
	CS 515 — Num. Anal. of Linear Systems	3
	An approved Math Science elective (possible choices are: MA 453, MA 521, MA 523, CS 482, CS 502, STAT 512, STAT 517.)	3

c) Systems and Programming Option (18 credits)

CS 402 — Architecture of Computers	3
CS 403 — Systems Programming	3
CS 480 — The Practicum in Computer Science	3
Three courses chosen from the following:	
CS 482 — Discrete Computational Structures	3
CS 484 — Theory of Computation	3
CS 502 — Compiler Techniques	3
CS 503 — Operating Systems	3
Advanced Statistics Course	3

A typical program for the first two years is as follows:

FRESHMAN YEAR

First Semester	Second Semester
(5) MA 163 (Integrated Calculus and Analytic Geometry I)	(5) MA 164 (Integrated Calculus and Analytic Geometry II)
(3) ENGL 104 (English Composition I)	(3)ENGL 105 (English Compositior II)
(3) CS 320 (Programming I)	(3)CS 320 (Programming II)
(3-4)Science Elective	(3-4) Science Elective
(14-15)	(14-15)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(4) MA 261 (Multivariate Calculus)	(4) MA 262 (Linear Algebra and Differential Equations)
(3) CS 300 (Assembly Language)	(3) CS 430 (Data Structures)
(6) Electives in Humanities	(6) Electives in Humanities
(3-4) Science Elective	(3-4) Science Elective
(16-17)	(16-17)

SPECIAL CREDIT OPPORTUNITIES:

The department has a regular program of offering advanced placement with credit in lower division courses. Incoming students should consult with their advisors or with the Mathematical Sciences Department to determine whether they may qualify for such placement with credit. In addition, students who wish to earn credit without advanced placement should petition the Mathematical Sciences Department head for credit by examination.

COMPUTER SCIENCES

Undergraduate Level

CS 215. NUMERICAL ANALYSIS I. Class 3, cr. 3. Prerequisites: MA 221 and CS 220 or equivalent.

Numerical methods for the solution of mathematical problems and the analysis of tabulated data. Emphasis is on the solution of specific problems by use of computers.

CS 220. PROGRAMMING I FOR ENGINEERS AND SCIENTISTS. Class 3, cr. 3. Prerequisite: MA 151

CS 220 and 320 form a two course sequence and provide an introduction to computers and flowcharting. The main emphasis is on programming a digital computer in the FORTRAN language to solve mathematical and scientific problems.

CS 300. ASSEMBLY LANGUAGE PROGRAMMING. Class 3, cr. 3. Prerequisite: CS 220.

Assembly language programming and structure of a typical computer. Number and character representation. Pseudo operations, macros, and input/output. Interfacing with programs written in a higher level language, parameter passing, and common storage. Organizing and debugging programs. A term project is usually required.

CS 315. NUMERICAL ANALYSIS II. Class 3, cr. 3. Prerequisites: CS 215 and MA 222.

A continuation of CS 215. Topics covered include: finite difference calculus and applications, differentiation techniques, and error analysis applied to these techniques.

CS 320. PROGRAMMING II. Class 3, cr. 3. Prerequisite: CS 220.

A continuation of CS 220.

CS 402. ARCHITECTURE OF COMPUTERS. Class 3, cr. 3. Prerequisite: CS 300. CS 320 is recommended.

Concepts of computer systems and hardware organizations. Processor organization, instruction forms and addressing modes, including microprogramming. Operation code design and automatic error correction. Real and virtual memory structures, paging, and interrupts. Vector and array processors. Emphasis is on high-level organization of subsystem components.

CS 403. SYSTEMS PROGRAMMING. Class 3, cr. 3. Prerequisites: CS 300 and 320. CS 402 is recommended.

Fundamental concepts of programming language processors and operating systems, one and two pass assemblers, macros, symbol tables, compilers, BNF grammars, parsing, syntax and semantic phases, optimization, relocatable and linking loaders. Operating systems: task managemet, data management, and job management.

CS 414. INTRODUCTION TO NUMERICAL ANALYSIS. Class 3, cr. 3. Prerequisite: MA 261, CS 220 or equivalent knowledge of programming.

Iterative methods for solving nonlinear equations; direct and iterative methods for solving linear systems; approximations of functions, derivatives and integrals; error analysis.

CS 430. DATA STRUCTURES. Class 3, cr. 3. Prerequisite: CS 320.

Specification, representation, and manipulation of basic data structures; linked lists, arrays, stacks, queues, trees, strings, symbol tables, Huffman codes, optimal search trees, pattern matching, priority queues, heaps, hash tables. Storage allocation, garbage collection, compaction, reference counts. List and string processing languages. Analysis of algorithms. Students are required to write programs in several languages.

CS 480. THE PRACTICUM IN APPLIED MATHEMATICS. (See MA 480).

CS 482. DISCRETE COMPUTATIONAL STRUCTURES. Class 3, cr. 3. Prerequisite: MA 261.

Finite and discrete mathematical structures relating to the theory of computers. Directed and undirected graphs and their relation to these structures. Combinatorial problems inherent in computation. Introduction to mathematical analysis of algorithmic complexity.

CS 484. THEORY OF COMPUTATION. Class 3, cr. 3. Prerequisite: CS 482 or MA 453 with consent of instructor.

Examples of various mathematical models for algorithmic processes; finite automata. Turing machines, formal language theory. Algebraic and graphical representration of these and other models.

CS 490. TOPICS IN COMPUTER SCIENCES FOR UNDERGRADUATES. Cr. 1-5.

Supervised reading and reports in various fields. Open to students only with the consent of the department.

DUAL LEVEL

Undergraduate-Graduate

CS 502. COMPILING AND PROGRAMMING SYSTEMS. Class 3, cr. 3. Prerequisite: CS 300.

Basic principles of compilers and compiler design; control of translation, loading and execution; symbolic coding systems; lexical and syntactic analysis, design and operation of assemblers and macroprocessors; design of interpretive systems. Students are expected to complete a large programming project as part of the course.

CS 503. OPERATING SYSTEMS. Class 3, cr. 3. Prerequisites: CS 402 and 502.

Basic principles of operating systems; addressing modes, indexing, relative addressing, indi-

rect addressing, stack maintenance; implementation of multitask systems; control and coordination of tasks, deadlocks, synchronization, mutual exclusion; storage management, segmentation, paging, virtual memory; protection, sharing, access control; file systems; resource management; evaluation and prediction of performance.

CS 514. NUMERICAL ANALYSIS. Class 3, cr. 3. Prerequisite: CS 414 or equivalent.

Iterative methods for solving nonlinear equations; linear difference equations, applications to solution of polynomial equations; differentiation and integration formulas; numerical solution of ordinary differential equations; roundoff error bounds.

CS 515. NUMERICAL ANALYSIS OF LINEAR SYSTEMS. Class 3, cr. 3. Prerequisites: MA 352; corequisite: CS 220 or equivalent knowledge of programming.

Computational aspects of linear algebra; linear equations and matrices; error analysis.

CS 590. TOPICS IN COMPUTER SCIENCES. Class 1-5. Cr. 1-5.

Directed study for students who wish to undertake individual reading and study on approved topics.

MATHEMATICS

SPECIAL SERVICE COURSES

MA 1. HIGH SCHOOL ALGEBRA. Class 3, cr. 0. Credit: one unit for admission.

This course is equivalent to a one year elementary high school algebra course.

MA 2. PLANE GEOMETRY. Class 3, cr. 0. Credit: one unit for admission. Prerequisite: MA 1.

This course is equivalent to a first course in elementary high school geometry.

UNDERGRADUATE LEVEL

MA 111. ALGEBRA. Class 3, cr. 3. Prerquisite: MA 2 or equivalent.

This is a second course in algebra.

MA 121. ELEMENTARY MATHEMATICS. Class 3, cr. 3.

A survey of mathematics with topics chosen from number theory, topology, set theory, geometry, algebra, and analysis.

MA 122. ELEMENTARY LOGIC AND SET THEORY. Class 3, cr. 3.

Set operations, power sets, one-to-one correspondence, and cardinal numbers; sentential calculus, restricted predicate calculus, negation, and logically valid arguments.

MA 135. MATHEMATICS FOR ELEMENTARY TEACHERS A. Class 3, cr. 3. Prerequisite: competency in computational arithmetic. Open only to students in elementary education.

The sequence MA 135-136 fulfills the mathematics requirement for elementary education majors.

Numeration systems; natural numbers, whole numbers, numbers of arithmetic, integers, a structural approach.

MA 136. MATHEMATICS FOR ELEMENTARY TEACHERS B. Class 3, cr. 3. Prerequisite: MA 135. Open only to students majoring in elementary education.

Rationals, reals, a structural approach; metric and non-metric geometry; probability and statistics.

MA 147. ALGEBRA AND TRIGONOMETRY FOR TECHNOLOGY I. Class 3, cr. 3. Prerequisite: MA 111 or equivalent. Not open to students with credit in MA 151, 153 or GNS 154.

MA 147 and 148 is a two semester sequence in algebra and trigonometry for students in technology. The emphasis is on technique and problem solving.

MA 148. ALGEBRA AND TRIGONOMETRY FOR TECHNOLOGY II. Class 3, cr. 3. Prerequisite: MA 147 or GNS 154. Not open to students with credit in MA 151 or MA 154.

Continuation of MA 147.

MA 150. MATHEMATICS FOR TECHNOLOGY. Class 5, Cr. 5. Prerequisite: MA 111 or equivalent.

This course covers the same material as MA 147 and MA 148. Students completing this course will be prepared to take MA 221.

MA 151. ALGEBRA AND TRIGONOMETRY. Class 5, cr. 5.

This course is intended for students who meet the requirements for admission to those departments whose curricula require MA 163 but whose background is insufficient for direct placement into MA 163.

MA 153. ALGEBRA AND TRIGONOMETRY I. Class 3, cr. 3. Prerequisite: MA 111 or equivalent. Not open to students with credit in MA 147, 148, or 151.

The content of MA 153, 154 is similar to that of MA 151 but the pace and emphasis is directed

to students who do not intend to take MA 163. All the trigonometry material is contained in MA 154.

MA 154. ALGEBRA AND TRIGONOMETRY II. Class 3, cr. 3. Prerequisite: MA 153. Not open to students with credit in MA 148 or 151.

Continuation of MA 153.

MA 163. INTEGRATED CALCULUS AND ANALYTIC GEOMETRY I. Class 5, cr. 5. Prerequisite: MA 151 or equivalent preparation.

Topics from plane analytic geometry. Introduction to differentiation and integration. Applications.

MA 164. INTEGRATED CALCULUS AND ANALYTIC GEOMETRY II. Class 5, cr. 5.Prerequisite: MA 163.

Continuaton of MA 163. Completion of introductory study of topics in plane analytic geometry and the calculus of one variable, infinite series.

MA 213. FINITE MATHEMATICS. Class 3, cr. 3. Prerequisite: MA 153 or equivalent.

MA 213 and 214 is a two course sequence. The topics discussed are: elementary logic and sets, finite probability theory, linear algebra, linear programming, theory of games. Markov chains, applications to business, behavioral and biological sciences.

MA 214. FINITE MATHEMATICS II. Class 3, cr. 3. Prerequisite: MA 213.

Continuation of MA 213.

MA 221. CALCULUS FOR TECHNOLOGY I. Class 3, cr. 3. Prerequisite: MA 148 or equivalent. Not open to students with credit in MA 163 or 223.

MA 221, 222 is a two semester sequence in the techniques of calculus for students enrolled in certain technical curricula.

MA 222. CALCULUS FOR TECHNOLOGY II. Class 3, cr. 3. Prerequisite: MA 221. Not open to students with credit in MA 224.

Continuation of MA 221.

MA 223. INTRODUCTORY ANALYSIS I. Class 3, cr. 3. Prerequisite: MA 154 or equivalent. Not open to students with credit in MA 163 or 221.

MA 223 and 224 form a two course sequence and provide an introduction to the differential and integral calculus of one and several variables, and elementary differential equations, with applications to business, behavioral and biological sciences.

MA 224. INTRODUCTORY ANALYSIS II. Class 3, cr. 3. Prerequisite: MA 223. Not open to students with credit in MA 164 or 222.

Continuation of MA 223.

MA 252. INTRODUCTION TO LINEAR ALGEBRA. Class 2, cr. 2. Prerequisite: MA 261.

Linear Algebra.

MA 261. MULTIVARIATE CALCULUS. Class 4, cr. 4. Prerequisite: MA 164.

Solid analytic geometry, partial differentiation, multiple integrals.

MA 262. LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS. Class 4, cr. 4. Prerequisite: MA 261.

Linear algebra, elements of differential equations.

MA 321. ADVANCED TECHNOLOGY MATHEMATICS I. Class 3, cr. 3. Prerequisite: MA 222. Not open to students with credit in MA 261.

Calculus of functions of several variables and other topics in calculus for Technology students.

MA 322. ADVANCED TECHNOLOGY MATHEMATICS II. Class 3, cr. 3. Prerequisite: MA 222. Not open to students with credit in MA 262. MA 321 is **not** a prerequisite for MA 322.

Matrix algebra, differential equations, Laplace transforms, and Fourier series for Technology students.

MA 352. INTERMEDIATE LINEAR ALGEBRA. Class 3, cr. 3. Prerequisite: MA 252 or MA 262.

Linear Transformations and Matrices, Diagonalization Problems, Canonical Forms, Inner Product Spaces.

MA 362. TOPICS IN ADVANCED CALCULUS. Class 3, cr. 3. Prerequisite: MA 262.

Multivariate calculus; partial differentiation, implicit function theorems, line and surface integrals, vector fields, theorems of Gauss, Green, and Stokes.

MA 422. DIFFERENTIAL EQUATIONS FOR ENGINEERING AND THE PHYSICAL SCIENCES. Class 3, cr. 3. Prerequisite: MA 262.

Derivation and solutions of additional types of differential equations for problems in science and engineering.

MA 453. ALGEBRA I. Class 3, cr. 3 Prerequisite: MA 262.

MA 453 and 454 is a two course sequence for mathematics majors. The topics discussed are: fundamental properties of groups, rings, integral domains, fields; homomorphisms; Abelian groups and modules; polynomials, solutions to algebraic equations, field extensions, vector spaces, linear transformations and their decomposition; inner product spaces, characteristic values.

MA 454. ALGEBRA II. Class 3, cr. 3. Prerequisite: MA 453.

Continuation of MA 453.

MA 480. THE PRACTICUM IN APPLIED MATHEMATICS. Class 3, cr. 3. (Same as CS 480)

The practicum course consists of a small team (a faculty advisor and 1-4 students) working on a real problem obtained in conjunction with a local business or industry. At least one term is required of all mathematics majors, except for those in the pure mathematics option. The course is recommended for students in the pure mathematics option, but is not required. Students in the secondary school teaching option may use ED 424, Supervised Teaching of Secondary School Subjects, to fulfill the practicum requirement. Not more than two terms of MA 480 and/or CS 480 may be taken for credit.

MA 490. TOPICS IN MATHEMATICS FOR UNDERGRADUATES. Cr. 1-5

Supervised reading and reports in various fields. Open only to students with the consent of the department.

DUAL LEVEL
Undergraduate-Graduate

MA 510. ADVANCED CALCULUS. Class 3, cr. 3. Prerequisite: MA 262.

Functions of several variables: partial derivative, differential; quadratic approximation, extrema; vector calculus, gradient; line, surface and volume integrals; divergence, curl, Laplacian, integral theorems; mappings, continuity, differentiability, inverse mapping; implict functions; orthogonal coordinates.

MA 520. BOUNDARY VALUE PROBLEMS OF DIFFERENTIAL EQUATIONS. Class 3, cr. 3. Prerequisite: MA 422 and MA 510.

Fourier Series, Sturm-Liouville theory; orthogonal expansions, separation of variables in partial differential equations; spherical harmonics.

MA 521. INTRODUCTION TO OPTIMIZATION PROBLEMS. Class 3, cr. 3. Prerequisite: MA 262.

Linear programming, simplex algorithm, calculus of variations, necessary and sufficient conditions for extrema.

MA 523. INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS. Class 3, cr. 3. Prerequisite: MA 262.

First order quasilinear equations and their application to physical and social sciences, characteristics, classification and canonical form of linear equations.

MA 525. INTRODUCTION TO COMPLEX ANALYSIS. Class 3, cr. 3. Prerequisite: MA 510.

Complex numbers and complex-valued functions; differentiation of complex functions; power series, uniform convergence; integration, contour integrals; elementary conformal mapping.

MA 534. ADVANCED ANALYSIS FOR ENGINEERS AND SCIENTIST. Class 3, cr. 3. Prerequisite: MA 510.

Metric and normed spaces, linear functionals and operators, contraction maps, implicit function and fixed point theorems.

MA 540. ANALYSIS I. Class 3, cr. 3. Prerequisite: MA 362.

Infinite series and products, sequences of functions, functions of a complex variable.

MA 541. ANALYSIS II. Class 3, cr. 3. Prerequisite: MA 540.

Fourier series and integrals, existence and properties of solutions of differential equations, special functions.

MA 547. ANALYSIS FOR TEACHERS I. Class 3, cr. 3. Prerequisite: MA 261.

Inequalities, sequences, functions, limits. Application to such basic concepts as length and area and their implications for the teacher of mathematics.

MA 548. ANALYSIS FOR TEACHERS II. Class 3, cr. 3. Prerequisite: MA 547.

Continuation of MA 547.

MA 550. ALGEBRA FOR TEACHERS I. Class 3, cr. 3. Prerequisite: MA 351 or graduate standing. May not be used for a major in mathematics.

Definitions and elementary properties of groups, rings. integral domains, field, vector spaces, and matrices, with major emphasis on the rings of integers, rational numbers, complex numbers and polynomials. Intended primarily for secondary school teachers.

MA 551. ALGEBRA FOR TEACHERS II. Class 3, cr. 3. Prerequisite: MA 550.

A continution of MA 550.

MA 553. INTRODUCTION TO ABSTRACT ALGEBRA. Class 3, cr. 3. Prerequisite: MA 453.

Basic properties of groups, rings, integral domains, fields, polynomials. Solvable groups. Finitely generated abelian groups. Algebraic and transcendental field extensions. Separable extensions. Normal extension, galois theory.

MA 554. LINEAR ALGEBRA. Class 3, cr. 3. Prerequisite: MA 453.

Vector spaces, linear transformations, matrices. Solution of systems of linear equations. Determinants. Inner product spaces; orthogonal reduction of symmetric matrices. Direct sum decompositions, characteristic values, diagonable and nilpotent transformations, Jordan normal form.

MA 556. INTRODUCTION TO THE THEORY OF NUMBERS. Class 3, cr. 3. Prerequisite: MA 261.

Divisibility, congruences, quadratic residues, diophantine equations, the sequence of primes.

MA 560. FUNDAMENTAL CONCEPTS OF GEOMETRY. Class 3, cr. 3. Prerequisite: MA 261.

Foundations of Euclidean geometry, including Euclid's "elements" and a detailed study of an axiom system such as that of Hilbert. Independence of the parallel axiom and introduction to non-Euclidean geometry.

MA 561. PROJECTIVE GEOMETRY. Class 3, cr. 3. Prerequisite: MA 261.

Ideal elements, duality, harmonic sets, projective metric; theory of conics, involution, imaginary elements.

MA 563. ADVANCED GEOMETRY. Class 3, cr.3. May not be used for a major in Mathematics.

A critique of Euclid's elements and a detailed study of Hilbert's postulates with an introduction to non-Euclidean geometry. Primarily for prospective secondary school teachers.

MA 571. ELEMENTARY TOPOLOGY. Class 3, cr. 3. Prerequisite: MA 540.

General topological spaces and continuity. Connectedness. Separation. Compactness. Metric spaces. Function spaces.

MA 581. INTRODUCTION TO LOGIC FOR TEACHERS. Class 3, cr. 3. Prerequisite: MA 351 and 361.

Sentential and general theory of inference and nature of proof; elementary axiom systems.

MA 583. HISTORY OF ELEMENTARY MATHEMATICS. Class 3, cr. 3.

A survey of elementary mathematics before the calculus. An effort will be made to link the history of mathematics to that of other sciences and to the social history of the relevant periods. Some acquaintance with ancient history of Europe is desirable.

MA 587. GENERAL SET THEORY. Class 3, cr. 3. Prerequisites: MA 387 or 441 or 453.

Set algebra. Functions and relations. Ordering relations. Transfinite induction. Cardinal and ordinal numbers. The axiom of choice. Maximal principles. The continuum hypothesis. Applications to algebra, analysis, and topology.

MA 598. TOPICS IN MATHEMATICS. Cr. 1-5.

Directed study and reports for students who wish to undertake individual reading and study on approved topics.

STATISTICS

Undergraduate Level

STAT 301. ELEMENTARY STATISTICAL METHODS I. Class 3, cr. 3. Prerequisite: MA 148.

A basic introductory statistics course with applications shown to various fields and emphasis placed on assumption, applicability, and interpretations, of various statistical techniques. Subject matter includes frequency distributions, descriptive statistics, elementary probability, normal analysis of variance, with emphasis on distribution applications, sampling distribution, estimation, hypothesis testing and linear regression.

STAT 490. TOPICS IN STATISTICS FOR UNDERGRADUATES. Cr. 1-5

Supervised reading and reports in various fields. Open only to students with the consent of the division.

DUAL LEVEL

Undergraduate-Graduate

STAT 502. EXPERIMENTAL STATISTICAL METHODS II. Class 3, cr. 3. Prerequisite: STAT 301 or equivalent.

Continuation of STAT 301. Subject matter includes multiple regression and analysis of variance, with emphasis on statistical inference and applications to various fields.

STAT 512. STATISTICAL METHODS. Class 3, cr. 3. Prerequisite: STAT 516.

Linear and multiple regression; nonlinear regression; analysis of variance; random, fixed, mixed models, expected mean squares, pooling, modifications under relaxed assumptions, multiple comparisons, variance of estimates; analysis of covariance. Experience in the use of statistical programs from the computing center library.

STAT 513. STATISTICAL QUALITY CONTROL. Class 3, cr. 3. Prerequisite: STAT 516.

A strong background in control charts including adaptations, acceptable sampling for attributes and variable data, standard acceptance plans, sequential analysis, statistics of combinations, moments and probability distributions, applications.

STAT 516. BASIC PROBABILITY AND APPLICATIONS. Class 3, cr. 3. Prerequisite: MA 164 or 224 or equivalent. MA 261 desirable.

A first course in probability intended to serve as a foundation for statistics and other applications.

Intuitive background; sample spaces and ran-

dom variables; joint, conditional, and marginal distributions; special distributions of statistical importance; moments and moment generating functions; statement and application of limit theorems; introduction to markov chains .

STAT 517. STATISTICAL INFERENCE. Class 3, cr. 3. Prerequisite: STAT 516, or equivalent.

A basic course in statistical theory covering standard statistical methods and their applications.

Estimation including unbiased, maximum likelihood and moment estimation; testing hypotheses for standard distributions, and contingency tables; confidence intervals and regions; introduction to nonparametric tests and linear regression.

STAT 532. ELEMENTS OF STOCHASTIC PROCESSES. Class 3, cr. 3. Must be preceded by STAT 516.

A basic course in stochastic models, including discrete and continous time markov chains and brownian motion, as well as an introduction to topics such as gaussian processes, queues, epidemic models, branching processes, renewal processes, replacement, and reliability problems.

DEPARTMENT OF NURSING

Joyce A. Ellis, Head

FACULTY: R. Alexander, E. Bratt, J. Brew, L.G. Buechley, J.A. Ellis, M.G. Engle, R.M. Givens, E. Jones, P. Kelly, M.A. Klen (Emeritus), G. McCoy, L. Orlich, D.L. Sabolsice, D. Slamkowski, G. Smokvina, J. Stryczek, M.A. Thomas, J. Waggoner, B. Watts, G. Wegner, E. Ramsey (Emertius).

The Department of Nursing offers a program of studies leading to the degree of Associate of Arts and Sciences in Nursing and eligibility to take the examination for licensure as a registered nurse. In addition an upper division nursing program for registered nurses leading to the degree of Bachelor of Science with a major in nursing is offered. Both programs of study are accredited by the National League for Nursing.

BACHELOR OF SCIENCE DEGREE (NURSING)

The upper-division baccalaureate degree program for registered nurses has as its purpose the preparation of a generalist with baccalaureate level nursing competencies. The curriculum is designed to provide career mobility for the associate degree and diploma graduate nurse. The program strives to provide a quality graduate capable of rendering holistic health care on a shared, interdisciplinary basis. This practitioner provides nursing services for people of all ages within the setting of the family community.

The graduate has advanced skills for assessing and managing the physical and psychosocial health-illness status of individuals, families or groups. Competencies include utilization of the nursing process to promote health, prevent illness, correct potential or actual health care problems, and restore the self care activities for individuals, families, and groups. Clinical nursing experiences are obtained in many health agencies located throughout Northwest Indiana and the larger Calumet Region including: St. Margaret's Hospital, Hammond; St. Catherine's Hospital, E. Chicago; Methodist Hospital, Gary; St. Anthony's Hospital & Home, Crown Point; Planned Parenthood Assoc., N.W. Ind.; N.W. Ind. Home Health Agency, V.N.A., Hammond; City of Chicago Heights Health Dept., Chicago Heights; Westside Nursing Home, Gary; E. Chicago Rehab. Center, E. Chicago; Munster Med-Inn, Munster; Lowell Robertson Child Care Centers, N.W. Ind.; Diocese of Gary Schools, Gary; School Cities of Hammond and Gary, Hammond, Gary.

The program aims to provide an adequate foundation for graduate study in Nursing. Through the Department of Nursing's activities related to education, service and research, it strives to promote the health care of the community.

BACCALAUREATE DEGREE CURRICULUM IN NURSING*

JUNIOR YEAR

			Class	Lab	Credit
First Semester					
BIOL	340	Human Physiology	3	0	3
BIOL	341	Lab in Human Physiology	0	4	2
—	—	Social Science Elective (Advanced)	3	0	3
NUR	300	Nursing Concepts I	6	9	9
		(Module A: Transition to Professional Nursing)	(1)	(0)	(1)
		(Module B: Assessment)	(2)	(6)	(4)
		Module Q: Health Science and Health Care Delivery)	(2)	(0)	(2)
		(Module D: Group Dynamics Related to the Nursing Process)	(1)	(3)	(2)
		Totals	12	13	17
Second Semester					
—	—	Social Science Elective (Advanced)	3	0	3
NUR	301	Nursing Concepts II	6	15	11
		(Module A: Community Nursing I: The Expectant Family)	(2)	(3)	(3)
		(Module B: Community Nursing II: Families with Children)	(1)	(6)	(3)
		(Module Q: Mental Health Nursing of Families)	(1)	(3)	(2)
		(Module D: Reproductive Health and Health Teaching)	(2)	(3)	(3)
			9	15	14

SENIOR YEAR

First Semester					
—	—	Science Elective (Advanced)	2-3	0-2	3
**COM	320	Group Discussion and Conference Leadership	3	0	3
NUR	400	Nursing Concepts III	6	12	10
		(Module A: Community Nursing of Adult & Aging Families)	(2)	(3)	(3)
		(Module B: Management of Acute Care Illness of Adults)	(2)	(6)	(4)
		(Module Q: Management of Long Term Illness of Adults	(2)	(3)	(3)
		Totals	11-12	12-14	16
Second Semester					
—	—	Science Elective (Advanced)	2-3	0-2	3
—	—	Elective	3	0	3
NUR	401	Nursing Concepts IV	5	15	10
		(Module A: Nursing Leadership and Preceptorship)	(3)	(15)	(8)

A total of 132 credits is required for the baccalaureate degree in nursing.

*A minimum of 60 semester hours must be at the 300 level course level or higher.

**Other communication courses may be subsituted.

(Module B: Methods of Research and Professional Issues)	(2)	(0)	(2)
Totals	11-12	15-17	16

Modules described within the four upper division nursing courses are variable title and variable credit modules which may be adjusted in a flexible manner without advance notice.

Requirements

Admission Requirements:

1. Successful completion of an associate degree or diploma program in nursing.
2. Achievement of status of registered nurse licensure. Graduate nurses who have not taken the licensing examination are admitted on the condition that they must achieve Registered Nurse status by the end of their first semester.
3. Have achieved a C average or 4.0 graduation index on point scale of 6.0 in all previous academic work. (Enrollments are limited, and a 4.5 academic grade index is recommended. Purdue has a 6.0 academic index scale.)
4. Comprehensive health examinations, chest X-ray, and tuberculin test clearance prior to starting affiliations in clinical agencies.
5. Malpractice insurance is required of all B.S. nursing students. The recomended coverage is $200,000 to $600,000.

Lower Division Requirements for 69 semester credit hours distributed as follows:

Science	(18)	Anatomy and Physiology, Chemistry, Biochemistry, Microbiology, Pharmacology, Math or other science core.
Communications	(9)	Speech Communication, English Composition I, English Composition II or Literature.
Nursing	(30)	Transfer credit or credit by examination.
Social Sciences	(9)	Introduction to Psychology, Introduction to Sociology or Child Psychology, Nutrition, or other advanced social science.
Elective(s)	(3)	History, Politics, Philosophy, Arts or other course.

NUR 290 (Guided Study in Nursing: 1-6 credits) may be used to provide core requirements needed in nursing, if deficient.

Students meeting the above requirements will be admitted to the University upon receipt of a completed baccalaureate nursing program (blue) application and transcripts from all universities/colleges they have attended. Students may seek admission as a pre-baccalaureate student and take up to 15 hours of non-nursing credit hours and/or selected non-clinical nursing courses (as space is available) or seek admission directly to one of the study options as described under 'Study Options.' No student will be allowed to enroll in a baccalaureate clinical nursing course until accepted for study by the Baccalaureate Nursing Admission Committee. Enrollments are limited. At the time of acceptance for study by the Baccalaureate Nursing Admissions Committee, the

student must make a commitment for full or part-time study for completion of the nursing curriculum.

Study Options

Study tracks are made available to provide full-time, half-time and quarter-time study. Requests for specific study tracks must be made in writing on the initial application at time of entry. Students selecting (PNT) pre-nursing study must again contact the Admissions Office prior to the application deadline to have their credentials moved before the Nursing Admissions Committee for Option A, B or C for a given academic semester. The application deadline for a Fall Semester is January 15 of that year, with a second application deadline of May 1. The application deadline for a Spring Semester is October 15 of the prior year.

All lower division requirements, including biochemistry, English II, Speech and nursing challenge examinations, if required, will be completed prior to beginning a selected study option. Diploma graduates must complete challenge examinations before admission to Option A, B, or C.

Option choices may only be changed by receiving approval from the B.S. Nursing Admissions Committee. Once admitted Option B or C students may request an option change. Requests should be made on an option change form which can be obtained from the Nursing Office (X170C). Request for option changes must be made a semester in advance.

Option A

Full-time study — Students take all courses each semester as they are scheduled in the curriculum plan. The program will be completed in two years under this option. Entry into required courses at the appropriate time is guaranteed. Option A is available only to students entering the Fall Semester.

Option B

Half-time study — Students take 7-9 credit hours per semester according to a prescribed plan. The program can be completed in a minimum of four years under this option. Entry into necessary courses at specific times is not guaranteed, although every effort is made to offer needed courses. Option B is available to students entering the Spring or Fall Semester.

Option C

Quarter-time study — Students take 4-7 credit hours per semester with the exception of the last semester when an eight credit hour course must be taken. The program may be finished in a minimum of 5-6 years under this option. Entry into necessary courses at specific times is not guaranteed, although every effort is made to offer the needed courses. Option C is only available to students entering the Fall Semester.

PNT Option

Students who have lower division requirements to complete or who are not ready to begin the nursing program may wish to be admitted under the PNT option. In this option a student may take up to 15 credit hours beyond the lower division requirements which will count toward the BS degree in Nursing. The pre-Baccalaureate admission status may be full or part-time at the convenience of the student.

When the student is admitted to the Baccalaureate Nursing Program under a specific option, only courses not previously taken will be required. This could make the course load considerably less.

Challenge examinations are available to establish either lower or upper division credits for qualified students. Students who need to do remedial work to establish lower division credit should request special admission to the Associate Degree program. Additional information may be obtained from the academic advisors in the Department of Nursing.

ASSOCIATE IN APPLIED SCIENCE DEGREE (NURSING)

This two-year program of nursing education provides a means of correlating the philosophy and standards of nursing education with those of general education. The over-all standards and policies of the University apply to the program in nursing as they do to the other educational programs within the University. The associate degree program is designed to fill the educational needs of qualified high school graduates who want to pursue a career as a registered nurse. Nursing education is provided in a collegiate setting where students share the responsibilities, privileges, and intellectual and social experiences of university life. Clinical nursing experiences are obtained in eleven cooperating area hospitals: St. Anthony Hospital, Crown Point; St. Catherine, East Chicago; St. Margaret, Hammond; St. Mary Medical Center, Gary; Our Lady of Mercy, Dyer; Methodist Hospital, Gary and Merrillville, Munster Med-Inn, Munster; Munster Community Hospital, Munster; West Side Nursing Home, Gary; East Chicago Rehabilitation Center, East Chicago; and other selected learning experiences. The University nursing faculty selects, supervises, and evaluates all learning experiences.

Graduates are prepared to function as a registered nurse at a beginning level of nursing competency. Competencies include the cognitive knowledge, humanistic values and psychomotor skills to deliver comprehensive direct care to clients in a variety of settings. The graduates are prepared to utilize the nursing process to help clients with common health problems meet their needs as well as function under the supervision of nurses with broader educational preparation when caring for clients with more complex health care needs.

In addition to the admission requirements for high school graduates listed on page 11, college transfer students must have completed at least 12 credit hours of college work, including evidence of successful completion of a chemistry course. (A grade index of 4.75 is recommended.) All Associate degree nursing students must have a comprehensive health examination, chest X-ray, and immunization clearance prior to starting affiliations in clinical agencies. Malpractice insurance is required of all Associate degree nursing students. The recommended coverage is $200,000 to $600,000. The University provides a blanket policy for $10.50 a year or students may submit other proof of professional liability insurance.

All candidates for admission are reviewed by a Nursing Admission Committee which meets three times a year; December, March, and June. Enrollments are limited, and students are selected based on their academic qualifications. Early application in the fall preceding the year of intended enrollment is recommended.

ASSOCIATE DEGREE CURRICULUM IN NURSING

FRESHMAN YEAR

Summer Session			Class	Lab	Credit
CHM	119	General Chemistry	2	3	3

First Semester					
BIOL	203	Human Anatomy and Physiology	2	2	3
PSY	120	Elementary Psychology	3	0	3
ENGL	104	English Composition I	3	0	3
NUR	114	Perspectives in Nursing	1	0	1
NUR	115	Nursing I (Introduction to Nursing)	4	9	7
		Totals	13	11	17
Second Semester					
BIOL	204	Human Anatomy and Physiology	2	2	3
PCOL	201	Pharmacology	3	0	3
F & N	303	Foods and Nutrition	3	0	3
NUR	116	Nursing II (Medical-Surgical Nursing of Adults and Children)	4	9	7
		Totals	12	11	16

SOPHOMORE YEAR

First Semester					
BIOL	220	Introduction to Microbiology	2	3	3
SOC	100	Introduction to Sociology	3	0	3
NUR	224	Nursing III (Medical-Surgical Nursing of Adults and Children)	5	15	10
		or **Totals**	10	18	16
(NUR	225	Maternal Child Health Nursing)	(3)	(9)	(6)
(NUR	240	Psychiatric Mental Health Nursing)	(3)	(9)	(6)
Suggested option for students who have had SOC 100			(11)	(21)	(18)
Second Semester					
		Elective	3	0	3
NUR	225	Maternal Child Health Nursing	3	9	6
NUR	240	Psychiatric Mental Health Nursing	3	9	6
NUR	260	Issues in Nursing	2	0	2
		or **Totals**	11	18	17
(NUR	224	Nursing III (Medical-Surgical Nursing of Adults and Children)	(5)	(15)	(10)
			(10)	(15)	(15)

Nursing courses must be taken in sequence. Part-time students may enroll for general education courses first.

Associate Degree graduates may seek admission to the baccalaureate degree nursing program after completing an additional summer session to satisfy lower division requirements, (CHM 219, COM 114, ENGL 105).

PROGRESSION REQUIREMENTS FOR NURSING MAJORS:

1. All Purdue students must meet the University requirements for graduation.
2. Students enrolled in nursing majors must maintain a 4.00 cumulative graduation index. (Purdue is on 6.0 academic index scale.)

3. A minimum grade of "C" is required in each nursing (NUR) course in the major. The theory and clinical component of a course must each meet this regulation.
4. The clinical laboratory grade component of each nursing (NUR) course must be satisfactory, i.e., a good grade in theory **does not** balance out a failing clinical grade.
5. All baccalaureate students must pass BIOL 301 with a grade of C or better.
6. During the Associate Degree Nursing Program only **one** nursing (NUR) course may be repeated because of a failing (D or F) grade. This course may be repeated one time. Withdrawal from a course with a failing grade will be considered equivalent to a final failing grade.

UNDERGRADUATE COURSES

NUR 100. GUIDED READINGS IN NURSING. Class 1, cr. 1.

For nursing students and/or others with an interest related to nursing practice. Current literature and events related to nursing.

NUR 114. PERSPECTIVES IN NURSING. Class 1, cr. 1.

Analyze the history of nursing and its relationship to the role of the nurse in society today. Know beginning legal and ethical implications for the nurse. Focus on student problems encountered in beginning clinical practice.

NUR 115. NURSING I: INTRODUCTION TO NURSING. Class 4, Lab. 9, cr. 7.

Explores the concepts of health, illness, man's pursuit of wholeness and nursing intervention through the use of the nursing process. Basic human needs, interpersonal relationships, and dynamics of behavior are studied. Laboratory experience is provided in the college, hospitals, and other community agencies.

NUR 116. NURSING II: MEDICAL-SURGICAL NURSING OF ADULTS AND CHILDREN. Class 4, Lab. 9, cr. 7.

Applies the nursing process to the care of adults and children who experience problems related to selected basic human needs. Surgical intervention as a stress situation is studied. Laboratory experiences are provided in hospitals and other agencies.

NUR 224. NURSING III: MEDICAL-SURGICAL NURSING OF ADULTS AND CHILDREN. Class 5, Lab. 15, cr. 10.

Utilizes the nursing process in caring for adults and children who experience complex problems related to selected basic human needs. Laboratory experiences are provided in hospitals and other community agencies.

NUR 225. MATERNAL CHILD HEALTH NURSING. Class 3, Lab. 9, cr. 6.

Applies the nursing process in caring for the emerging family group throughout the maternal cycle and childhood. Includes the study of normal growth and development and the care of children with diseases unique to childhood. Laboratory experiences are provided in hospitals and other community agencies.

NUR 240. PSYCHIATRIC MENTAL HEALTH NURSING. Class 3, Lab. 9, cr. 6.

Integrates the pursuit of wholeness with a study of personality structure and common psychiatric disorders. Applies principles of individual and group behavior to the emotionally ill. Laboratory experiences are provided in hospitals and other community agencies.

NUR 260. ISSUES IN NURSING. Class 2, cr. 2.

Study challenges, responsibilities, and employment opportunities for the registered nurse. Examine current trends in health care, professional issues, nursing practice standards, legal aspects of nursing, and implications of health legislation.

NUR 290. GUIDED STUDY IN NURSING. Class 1-6. cr. 1-6.

Designed to provide core curriculum requirements in nursing for individual students enrolled in the baccalaureate program.

FIFTH SEMESTER

NUR 300. NURSING CONCEPTS I. Class 1-6, Lab. 0-12, cr. 1-10 (Variable Module course pattern.) Prerequisite: Lower Division Requirements or by consent of instructor. Corequisite: BIOL 340-341.

The theoretical constructs in nursing are explored. Beginning assessment skills and techniques are practiced with emphasis on physical assessment, health histories and interviewing techniques. The health care system is evaluated and health promotion is emphasized. Group theories, dynamics, processes and related concepts are examined.

MODULE DESCRIPTIONS:

NUR 300. MODULE A — TRANSITION TO PROFESSIONAL NURSING. Class 1, cr. 1.

The professional nursing role is examined with emphasis given to emerging roles. Values are clarified. Major nursing theories are introduced and related concepts from systems theory, change theory and decision making theory are identified. The relationship between theories and actual solution of health problems is explored through framework of the nursing process.

NUR 300. MODULE B — ASSESSMENT. Class 2, Lab. 6, cr. 4. Prerequisite: lower division core or consent of instructor. Corequisite: BIOL 340-341, NUR 300A.

Beginning physical and psychosocial assessment skills are developed. The interview process is utilized to obtain a comprehensive health history. Complete physical examinations of adults are performed in a laboratory setting. Dimensions of health are examined and the adaptational status determined.

NUR 300. MODULE Q — HEALTH SCIENCE & HEALTH CARE DELIVERY. Class 2, cr. 3. Prerequisite: lower division core or consent of instructor.

This course is a study of the community and its implications for community health practice. Epidemiological, biostatistical, environmental, sociological and cultural approaches are considered to gain a holistic view of the clients community and their health problems. The health care delivery system in the United States is studied to gain a perspective of the political, social and international trends in delivering health care.

NUR 300. MODULE D — GROUP DYNAMICS RELATED TO NURSING PROCESS. Class 1, Lab. 3, cr. 2. Prerequisite: lower division core or consent of instructor. Corequisite: NUR 300A.

Theories, group dynamics, process and related concepts are examined. Current theories for nursing intervention with groups are studied. Adaptive and maladaptive elements of groups in health care systems are evaluated. In addition, each student carries a caseload of one group and takes part in group interactions during laboratory time.

SIXTH SEMESTER

NUR 301. NURSING CONCEPTS II. Class 1-6, Lab. 0-15, cr. 1-11 (Variable Module course pattern.) Prerequisites: NUR 300 or by consent of instructor, **BIOL 340-341 with a grade of C or better.** Corequisite: none.

Assessment skills and techniques are continued. Sexuality and common reproductive health problems are studied. Beginning families and families with school age children in the community are examined. Behavioral concepts and interactional processes are analyzed as they apply to family life. A health education project is developed and implemented.

MODULE DESCRIPTIONS:

NUR 301. MODULE A — COMMUNITY NURSING I. THE EXPECTANT FAMILY. Class 2, Lab. 3, cr. 3. Prerequisites: NUR 300A, B, Q, D.

This community health nursing practice focuses on nursing needs of the expectant family. The nursing process is used to evaluate health needs from conception through the first month of life. Emphasis is upon health promotion and maintenance of maternal-child health. Supportive educative, and partially compensatory health care services are provided. Clinical experiences are provided in prenatal clinic, hospital nursery, post-partum units and other select settings.

NUR 301. MODULE B — COMMUNITY NURSING II. FAMILIES WITH CHILDREN. Class 1, Lab. 6, cr. 3. Prerequisites: NUR 300A, B, Q, D, BIOL 340-341.

The health needs of families with children encountered in various community settings are studied. Health screening is used to evaluate health needs from birth through adolescence. Special emphasis is on health promotion and maintenance in development of plans of care for children. Supportive educative and partially compensatory approaches to promote optimum child health are used. Clinical experiences are gained in home settings, schools, and social agencies and clinics that have children as clients.

NUR 301. MODULE Q — MENTAL HEALTH NURSING OF FAMILIES. Class 1, Lab. 3, cr. 2. Corequisite: NUR 300A.

Emphasis is placed on family theory, socio-interactional aspects of family life, the family developmental cycle and the means by which health care providers effect change within family systems. Behavioral concepts and interactional processes are analyzed as they apply to family development. Each student carries a caseload of one family from expectant through adolescent stages of development. Supervision is provided for the student in group settings as well as individually.

NUR 301. MODULE D — REPRODUCTIVE HEALTH AND HEALTH TEACHING. Class 2, Lab. 3, cr. 3. Prerequisites: NUR 300A, B, Q, D, BIOL 340-341.

In this course health assessment and role socialization continues with a special focus on sexual and reproductive aspects. As the student gains self-perception regarding sexuality, the nursing process is utilized in assessing problems of reproductive health. This course is also concerned with the principles of teaching and learning as related to developing skills in group teaching and providing educative health care. Clinical experiences are provided in family planning agencies, health screening clinics and venereal disease agencies.

NUR 315. TRANSACTIONAL ANALYSIS. Class 1-3, Lab. 0. cr. 1-3. (variable credit.)

This course focuses on the basic concepts of transactional analysis. Intrapersonal and interpersonal aspects of human behavior in families, work situations, and social groups are analyzed using the concepts of structural analysis, life positions, script analyses, time structuring, stroking, transactional analysis, and games.

NUR 399. SPECIAL TOPICS. Class 0-4, Lab. 0-6, Cr. 1-6.

Hours, credit, and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

SEVENTH SEMESTER

NUR 400. NURSING CONCEPTS III. Class 1-5, Lab. 0-15, cr. 1-10. (Variable course pattern.) Prerequisites: NUR 300, BIOL 340-341 with a C or better.

An indepth analysis of the health care needs of the family in the middle years and of those of the aged in the community setting. Emphasis is placed on the management of clients with acute and chronic conditions. The student may select an area of interest for concentrated study.

MODULE DESCRIPTIONS:

NUR 400. MODULE A — COMMUNITY NURSING OF ADULT AND AGING FAMILIES. Class 2, Lab. 3, cr. 3. Prerequisites: NUR 300A, B, Q, D, BIOL 340-341.

A continuation of Community Nursing II with emphasis on the application of nursing process toward meeting the health needs from adulthood through death. Health promotion, maintenance and restorative techniques are used with a caseload of adult and aging clients and families. Clinical experiences are provided in community settings such as community health agencies, health fairs, congregate meals, community centers, senior citizen centers, screening centers, clients' homes and nursing homes.

NUR 400. MODULE B — MANAGEMENT OF ACUTE CARE ILLNESS IN ADULTS. Class 2, Lab. 6, cr. 4. Prerequisites: NUR 300A, B, Q, D, BIOL 340-341.

Advanced concepts in nursing, stressing pathophysiological and psychosocial disturbances related to life threatening situations as well as the clients homeokinetic and adaptive response are explored. The management of insults to the cardiovascular-respiratory-renal system provide for a fundamental framework to evaluate protocols, nursing interventions and workable systems for family-centered adult client care.

NUR 400. MODULE Q —MANAGEMENT OF LONG-TERM ILLNESS IN ADULTS. Class 2, Lab. 3. cr. 3. Prerequisites: NUR 300A, B, Q, D, BIOL 340-341.

Concepts and practices in the delivery of primary care to mature and aged individuals and families with common health problems are examined. Students select an area of clinical interest. Emphasis is placed on clients with cancer, diabetes, and chronic cardio-vascular-respiratory problems. Multidisciplinary approaches to providing care is stressed. Community agencies such as the Visiting Nurse Association are utilized.

EIGHTH SEMESTER

NUR 401. NURSING CONCEPTS IV. Class 1-5, Lab. 0-15, cr. 1-10. (Variable Module course pattern.) Prerequisites: NUR 300, NUR 301, NUR 400, Corequisite: COM elective, 300 level or above.

Special problems in management of long term illnesses are examined. Medical-legal problems and nursing issues affecting the generalist professional nurse practitioner are analyzed. Research problems are examined and use of the results of recent research is encouraged.

MODULE DESCRIPTIONS:

NUR 401. MODULE A — NURSING LEADERSHIP AND PRECEPTORSHIP. Class 3, Lab. 15, cr. 8. Prerequisites: NUR 300, NUR 301, NUR 400, or consent of instructor. Corequisite: COM elective (advanced).

Leadership theories, both operational and behavioral establish the theoretical framework upon which this course is based. The learner arranges his/her own self-directed learning experience with an appropriate preceptor incorporating the decision-making concerns of client care.

NUR 401. MODULE B — METHODS OF RESEARCH AND PROFESSIONAL ISSUES. Class 2, cr. 2. Prerequisite: none. Corequisite: NUR 300A.

Introduction to research in nursing is studied with emphasis on its relationship and impact on clinical problems. Nursing is considered in relation to significant societal trends and medical-legal issues confronting the profession. Opportunities for continued professional development are explored.

NUR 415. PATHOPHYSIOLOGICAL PROCESSES. Class 1-3, Lab. 0. cr. 1-3. (Variable credit.) Prerequisites: BIOL 301 or consent of instructor.

This course is designed to examine the most common morbidity problems manifested by adult clients. Pathophysiological processes are explored; compensatory mechanisms are investigated and the rationale for designing appropriate interventions is appraised.

Transfer Programs

AGRICULTURE

The School of Agriculture at the Lafayette Campus offers the programs described in this section. They are administered locally by the Departrment of Biology in the School of Science and Nursing.

The School of Agriculture trains students for many types of agricultural work including not only farming but also related educational and industrial activities. Nine departments in the School of Agriculture offer optional programs preparing students for jobs in research, teaching, and extension, as well as in various related commercial enterprises. Instructional work is based on fundamental training in biology, chemistry, and physics, together with courses in history, economics, English, psychology, and other similar fields.

Students in Northwest Indiana are being offered the opportunity to complete the first two years of requirements for Purdue's Bachelor of Science degree in Agriculture at the Calumet Campus. After the two-year course of study at Calumet, students may complete requirements for graduation at the West Layfayette Campus.

Students may qualify for admission to the Schools of Foresty and Veterinary Medicine at Purdue, West Lafayette, by completing two years of courses in the School of Agriculture at the Calumet Campus and then transferring to West Lafayette. These students are advised to have alternative objectives in mind, since only a limited number of candidates can expect to be admitted to the Schools of Forestry and Veterinary Medicine.

The following two year programs are offered through the Department of Biology at the Calumet Campus. They satisfactorily prepare students who will be transferring to West Lafayette for thirty or more options which may be completed in the School of Agriculture. An advisor should be consulted to determine which courses and which programs are best suited to the student's interests.

PLAN OF STUDY IN GENERAL AGRICULTURE

FRESHMAN YEAR

First Semester	Second Semester
(3) MA 153 (Algebra and Trigonometry I)	(3) MA 154 (Algebra and Trigonometry II)
(3) CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(4) BIOL 109 (Biology of Animals)	(4) BIOL 108 (Biology of Plants)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(1) AGR 101 (Agricultural Lecture)	(3) Agricultural elective
(3) Agricultural elective	
(17)	(16)

SOPHOMORE YEAR

Third Semester

(3) COM 114 (Fundamentals of Speech Communication)
(4) CHM 251 (Organic Chemistry)
(1) CHM 252 (Organic Chemistry Lab)
(3) CIS 200 (Computer Programming Fundamentals)
(6) Elective

(17)

Fourth Semester

(3-4) *BIOL 221 (Introduction to Microbiology) or
STAT 301 (Elementary Statistical Methods I)
(3) ECON 210 (Principles of Economics)
(3) AGRY 430 (Genetics)
(1) AGRY 429 (Genetics Laboratory)
(6) Elective

(16-17)

PLAN OF STUDY IN PREFORESTRY

FRESHMAN YEAR

First Semester

(1) AGR 101 (Agricultural Lectures)
(4) BIOL 109 (Biology of Animals)
(4) CHM 115 (General Chemistry)
(3) ENGL 104 (English Composition I)
(5) MA 163 (Integrated Calculus and Analytic Geometry I)

(17)

Second Semester

(4) BIOL 108 (Biology of Plants)
(4) CHM 116 (General Chemistry)
(3) ENGL 105 (English Composition II)
(5) MA 164 (Integrated Calculus and Analytic Geometry II)

(16)

SOPHOMORE YEAR

Third Semester

(4) BIOL 285 (Environmental Biology)
(3) CET 104 (Elementary Surveying)
(4-5) CHM 251 (Organic Chemistry with lab), or MA 261 (Multivariate Calculus), or PHYS 220 (General Physics)
(3) COM 114 (Fundamentals of Speech Communication)
(3) Agriculture elective

(17-18)

Fourth Semester

(3) AGRY 255 (Soil Science)
(3) CIS 200 (Computer Programming Fundamentals)
(3) ECON 210 (Principles of Economics)
(3) STAT 301 (Elementary Statistical Methods I)
(3) HESS elective
(3) FOR 103 (Introduction to Natural Resource Conservation)

(18)

*Course depends on option chosen.

PLAN OF STUDY IN PREVETERINARY SCIENCE AND MEDICINE

(Seven-year plans including a four-year baccalaureate degree in Biology or Agriculture followed by a three-year program in Veterinary Medicine are also available. See academic advisor for details.)

FRESHMAN YEAR

First Semester

(3) MA 153 (Algebra and Trigonometry I)
(3-4) *CHM 111 (General Chemistry)
or
CHM 115 (General Chemistry)
(4) *BIOL 109 (Biology of Animals)
or
BIOL 101 (Introductory Biology)
(3) ENGL 104 (English Composition I)
(1) AGR 101 (Agriculture Lecture)
(3) Elective

(17-18)

Second Semester

(3) MA 154 (Algebra and Trigonometry II)
(3-4) *CHM 112 (General Chemistry)
or
CHM 116 (General Chemistry)
(4) *BIOL 108 (Biology of Plants)
or
BIOL 102 (Introductory Biology)
(3) ENGL 105 (English Composition II)
(3) HESS elective

(16-17)

SOPHOMORE YEAR

Third Semester

(4) PHYS 220 (General Physics)
(3) CHM 255 (Organic Chemistry)
(1) CHM 254 (Organic Chemistry Laboratory)
(3) COM 114 (Fundamentals of Speech Communication)
(3) ECON 210 (Principles of economics)
(3) Elective

(17)

Fourth Semester

(4) PHYS 221 (General Physics)
(3) CHM 256 (Organic Chemistry)
(1) CHM 258 (Organic Chemistry Laboratory)
(3-4) Elective or CHM 223 (Introductory Qualitative Analysis)
(3) AGRY 430 (Genetics)
(1) AGRY 429 (Genetics Laboratory)
(3) ANSC 221 (Introductory Animal Nutrition)

(18-19)

ELECTIVES

(May be used in all programs)

(3) AGRY 255 (Soil Science)
(4) AGRY 429, 430 (Genetics)
(3) ANSC 102 (Introduction to Animal Agriculture)
(3) ANSC 161 (Introduction to Food Science)
(3) ANSC 221 (Introductory Animal Nutrition)
(3) HORT 102 (Fundamentals of Horticulture)

*Course depends on option chosen

AGRICULTURE

UNDERGRADUATE LEVEL

AGR 101. AGRICULTURAL LECTURES. Class 2, cr. 1.

To acquaint new students in agriculture with the important problems and opportunities in various fields of agriculture.

AGRONOMY

UNDERGRADUATE LEVEL

AGRY 105. CROP PRODUCTION. Class 2, Lab. 2, cr. 3.

Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop production situations, including basic soils, agricultural meteorology, and crop physiology and breeding.

AGRY 255. SOIL SCIENCE. Class 1, Rec. 1, Lab. 3, cr. 3. Prerequisite: one year college chemistry.

Differences in soils; soil genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use.

AGRY 429. GENETICS LABORATORY. Lab. 2, cr. 1. Prerequisite or corequisite: AGRY 430.

Experiments and demonstrations with higher plants, fruit flies, flour beetles, mice, bacteria, viruses, and fungi to elucidate the basic principles of genetics.

AGRY 430. GENETICS. Class 3, cr. 3. Prerequisite: BIOL 108 or 109, or equivalent.

The transmission of heritable traits, probability; genotypic-environmental interactions; chromosomal abberations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding.

ANIMAL SCIENCES

ANSC 101. ANIMAL AGRICULTURE. Class 3, cr. 3.

A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy, and meat animals.

ANSC 161. INTRODUCTION TO FOOD SCIENCE. Class 3, cr. 3.

The world food supply in relation to biological and cultural requirements of man; principles and trends in food procurement and preservation; new product development; nutritional changes involved in processing and distribution of man's food.

ANSC 221. INTRODUCTORY ANIMAL NUTRITION. Class 3, cr. 3. Prerequisite: CHM 111 or 112, or equivalent.

A study of the digestive processes, composition of feedstuffs, nutritional requirements, and formulation of practical rations for farm animals.

FORESTRY AND CONSERVATION

UNDERGRADUATE LEVEL

FOR 225. DENDROLOGY. Class 3, Lab. 3, cr. 4. Prerequisite: BIOL 108 or equivalent.

Field identification, taxonomy, and silvical characteristics of forest trees and shrubs.

HORTICULTURE

UNDERGRADUATE LEVEL

Lower-Division Courses

HORT 102. FUNDAMENTALS OF HORTICULTURE. Class 3, cr. 3.
Study of the biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products.

CONSUMER AND FAMILY SCIENCES

Dean Compton in charge, West Lafayette

Programming in Consumer and Family Sciences at the Calumet Campus administered by the Department of Behavioral Sciences is mainly designed to offer the first year or two of some curricula for area students who must then transfer to the Lafayette Campus for the completion of the baccalaureate degree. A few graduate courses are offered to meet the needs of qualified students in the field.

The plan of study in Consumer and Family Sciences is designed to prepare young men and women for professional work in the various areas of the field and at the same time to provide a broad general education which prepares the student to meet the needs of home and community living.

Representative of the areas of concentration are clothing and textiles, foods and nutrition, foods in business, food research, home economics extension, housing, vocational home economics teaching, institutional management and interior design.

Students interested in preparation for work in the fields mentioned above should enroll in the curriculum listed below.

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(3) SOC 100 (Introductory Sociology)	(3) PSY 120 (Elementary Psychology)
(3) CSR 132 (Survey of the Clothing Field)	(3) CSR 256 (Introduction to Residential Interiors)
(1) CSR 122 (Clothing I)	(3) F&N 205 (Foods I)
(3) A&D 105 (Design I)	(3) CHM 112 (General Chemistry)*
(3) Mathematics	(3) Elective
(3) CHM 111 (General Chemistry)*	
(19)	(18)

SOPHOMORE YEAR

Refer to current School of Consumer and Family Sciences bulletin. See curriculum for option selected. The areas of concentration with specific options in each area are as follows:

CHILD DEVELOPMENT AND FAMILY STUDIES

Child Development and Family Studies
Early Childhood Education

*Other general chemistry courses accepted except chem 107, 108, and GNS 160.

CONSUMER SCIENCES AND RETAILING

Apparel Technology
Consumer Affairs
Consumer Financial Advising
Environmental Design
Retailing
Textile Science

FOODS AND NUTRITION

Coordinated Dietetic Program
Dietetics
Foods and Nutrition in Business
Food Science
Nutrition Science

RESTAURANT, HOTEL, AND INSTITUTIONAL MANAGEMENT

Restaurant, Hotel, and Institutional Management — Business
Restaurant, Hotel, and Institutional Management — Hotel Management
Restaurant, Hotel, and Institutional Management — Restaurant Management
Restaurant, Hotel, and Institutional Management — Administrative Dietetics
Coordinated Dietetics Program
Associate Degree Program for Dietetic Technician — Food Service Management

INTERDISCIPLINARY AREAS

Home Economics Education:
Consumer/Homemaker Education
Occupational Education
Option X

CONSUMER AND FAMILY SCIENCES

CFS 101. ANALYSIS OF PROFESSIONS IN CONSUMER AND FAMILY SCIENCES. Class 1, cr. 1.

General orientation and the study of the professional opportunities in the various areas of consumer and family sciences.

CHILD DEVELOPMENT AND FAMILY STUDIES

D.W. Felker, Head (W. Lafayette)

DUAL LEVEL

Undergraduate-Graduate

CDFS 501. ADVANCED TECHNIQUES AND THEORIES OF PLAY. Class 2, Lab. 2, cr. 3. Prerequisite: CDFS 311, or 401, or their equivalents. Senior standing.

Theories of the function of play in the development of the child and implications of recent research for facilitating play experiences for young children.

CDFS 520. INFANT BEHAVIOR. Class 3, cr. 3. Prerequisite: A total of nine hours of psychology or CDFS.

An examination of the methods and theories currently used to study normal infant development. Particular attention is given to issues related to infant-adult interaction. The course also provides opportunities to observe infants in a laboratory setting.

CDFS 530. CURRICULUM AND INSTRUCTION IN EARLY CHILDHOOD EDUCATION. Class 3, cr. 3. Must be preceded by 15 hours in education, psychology, or child development.

An analysis of curriculum development and its implications for growth trends during the formative years of the young child. Special attention will be given to principles of curriculum development, instructional design, content areas, instructional techniques, and evaluation procedures.

CDFS 551. PARENT EDUCATION. Class 3, cr. 3. Prerequisites: a total of 15 hours in education, psychology, and child development.

Principles of child study as communicated by films, creative activities, speakers, observation, and discussion in considering children's needs, parent guidance, and teacher attitudes. Designed for students, teachers, and interested parents.

CDFS 590. SPECIAL PROBLEMS. Cr. 0-5. Prerequisite: a total of 15 hours in education, psychology, and child development.

Special subjects for investigation and experiment according to the individual student's interest and need.

CONSUMER SCIENCES AND RETAILING

Fern Rennebohm, Head (W. Lafayette)

UNDERGRADUATE LEVEL

CSR 122. CLOTHING I. Lab. 3, cr. 1. Credit not given for both CSR 122 and 123.

Experimental study of fabric characteristics and construction principles in creating a unified garment.

CSR 132. SURVEY OF THE CLOTHING FIELD. Class 3, cr. 3.

Aesthetic, cultural and technological factors in the selection of clothing and textiles. Retailing and other career opportunities in the field.

CSR 209. INTRODUCTION TO FASHION RETAILING. Class 3, cr. 3. Not open to freshman.

Retail career paths, management training, merchandise control, organization, and service structure, and a comparison of store types.

CSR 256. INTRODUCTION TO RESIDENTIAL INTERIORS. Class 2, Lab. 2, cr. 3.

Defining of space needs and furnishings. Selections for family living. Interpretation design and basic principles of pattern construction through drafting.

DUAL LEVEL

Undergraduate-Graduate

CSR 526. PATTERN DESIGN. Class 1, Lab. 4, cr. 3. Prerequisites: CSR 132, and CSR 122 or CSR 123, or consent of department head.

Interpretation of design and basic principles of pattern construction through drafting.

CSR 528. CLOTHING DESIGN. Class 1, Lab. 4, cr. 3. Prerequisites: CSR 132, and CSR 122 or CSR 123, or consent of instructor.

Investigation of design sources and development of individual designs by draping. Field trip: cost of meals and transportation borne by student.

CSR 533. READINGS IN TEXTILES AND CLOTHING. Class 3, cr. 3. Prerequisite: consent of head of department.

Multidisciplinary survey and critical analysis of theoretical and research literature which is relevant to the field of clothing and textiles.

CSR 584. CONSUMER INVESTMENT AND SAVINGS DECISIONS. Class 3, cr. 3. Prerequisite: ECON 251 or equivalent or consent of instructor.

Economic analysis of consumer investments in durables, housing, and financial assets and in human capital through education, health, and childraising activities.

CSR 585. CONSUMER LAW. Class 3, cr. 3. Prerequisite: ECON 251 or equivalent.

A study of the interaction of our legal system with our economic system. Emphasis will be on those aspects of law most relevant to students of consumer economics.

CSR 590. SPECIAL PROBLEMS. Cr. 1-4.

Individual problems.

FOODS AND NUTRITION

R.P. Abernathy, Head (W. Lafayette)

UNDERGRADUATE LEVEL

F&N 203. FOODS: THEIR SELECTION AND PREPARATION. Class 2, Lab. 3, cr. 3. Credit not given for both F&N 203 and F&N 205.

Priniciples of food selection. Preparation, and meal planning.

F&N 205. FOODS I. Class 1, Lab. 4, cr. 3. Prerequisite: CHM 111; prerequisite or corequisite: CHM 112. Credit not given for both F&N 203 and F&N 205.

Scientific principles and techniques in food preparation.

F&N 303. ESSENTIALS OF NUTRITION. Class 3, cr. 3. No prerequisites. Credit not given for both F&N 303 and F&N 315.

Basic nutrition and its application in meeting nutritional needs of all ages.

F&N 315. FUNDAMENTALS OF NUTRITION. Class 3, cr. 3. Prerequisites: organic chemistry and physiology. Credit not given for both F&N 303 and F&N 315.

Basic principles of nutrition and their applications in meeting nutritional needs during the life cycle.

DUAL LEVEL

Undergraduate-Graduate

F&N 525. MATERNAL, INFANT, AND CHILD NUTRITION. Class 3, cr. 3. Should be preceded by F&N 435 or equivalent.

Nutrition and physiological interrelationships during pregnancy, lactation, infancy, and childhood.

F&N 538. READINGS IN NUTRITION. Cr. 2-3. Prerequisite: F&N 435 or consent of instructor.

Survey of recent literature in the field of nutrition.

F&N 590. SPECIAL PROBLEMS IN NUTRITION. Cr. 1-4. Credits and hours to be arranged. Admission by consent of instructor.

Individual problems dealing with various aspects of nutrition.

FACULTY AND STAFF

A. JOSEPH ADAMS (1968) ..... Head, Department of Information Systems and Computer Programming. Professor of Information Systems and Computer Programming.
B.S., Notre Dame, 1952; M.S., Illinois Institute, 1964; C.P.P., 1973 (P.E., California, Indiana).

WALTER F. C. ADE (1959-1976) ..... Professor Emeritus of Modern Languages and Education.
B.A., Queen's (Canada), 1933; M.A., Toronto (Canada), 1939; B.PAEd., M.Ed., 1943; M.S.Ed., Indiana, 1955; Ph.D., Northwestern, 1949; Ed.D., Indiana, 1960.

ASHFAQ AHMED (1980) ..... Visiting Assistant Professor of Electrical Engineering Technology.
H.S.C., National College, 1968; B.E., University of Karachi (Pakistan), 1973; M.A.SC., Waterloo, 1978.

AKTERUZZAMAN (1980) ..... Visiting Assistant Professor of Electrical Engineering Technology.
B.S.E.E., Engineering University (Bangladesh), 1974; M.S.E.E., 1976; M.S.E.E., Illinois Institute, 1980.

RINDA J. ALEXANDER (1980 — North Central, 1975) .... Assistant Professor of Nursing.
B.S., Purdue, 1975; M.S., St. Xavier, 1976; (R.N., Indiana).

JOHN B. ALLISON (1980) ..... Visiting Instructor in English.
B.A., Indiana, 1975; M.A., Chicago, 1976.

CLAYTON W. ANDERSON (1970) ..... Professor of Industrial Management.
B.S., De Paul, 1947; M.S., Indiana, 1950; M.B.A., Chicago, 1954; Ph.D., Northwestern, 1969.

KAREN L. ANDERSON (1980) ..... Instructor in Biology.
A.B., Vassar, 1973; M.S., Connecticut, 1975.

ROBERT L. ANDERSON (1947) ..... Professor of Electrical Engineering Technology.
B.S., Rose Polytechnic, 1942; (P.E., Indiana).

EDWARD L. ANDREWS (1967 — West Lafayette, 1965).. Comptroller.
B.S., Indiana State, 1965.

KAREN P. BACUS (1972) ..... Assistant Professor of Communication.
B.A., B.S., Kansas State Teacher's, 1961, M.S., 1962; Ph.D., Kansas, 1974.

PHOEBE L. BAILEY (1979 — West Lafayette, 1975) ..... Assistant Director of Upward Bound.
B.A., Spelman, 1966; M.S., Purdue, 1972, Ph.D., 1979.

WILLIAM J. BARLOW (1971) ..... Assistant Professor of Mathematics and Statistics.
B.S., Missouri at Rolla, 1957; M.S., Illinois, 1965, Ph.D., 1971.

DIANE L. BARTKO (1980) ..... Director of Alumni Relations and Coordinator of University Publications.
B.A., Purdue, 1978; M.S., Roosevelt, 1979.

ROBERT D. BECHTEL (1966) ..... Professor of Mathematics Education.
B.S., McPherson, 1953; M.S., Kansas State, 1959; Ph.D., Purdue, 1963.

LARRY L. BECK (1966) ..... Director of Physical Plant; Assistant Professor of Architectural Technology.
A.A.S., Purdue, 1963, B.S., 1966; M.B.A., Chicago, 1971.

RALPH E. BENNETT (1970) ..... Head, Department of Construction Technology; Associate Professor of Civil Engineering Technology.
B.S., Wisconsin, 1962; M.S., Illinois Institute, 1972; (P.E., Indiana, Illinois).

JOHN R. BILLARD (1980) ..... Associate Professor of Education.
B.S., S.U.C., Brockport, 1965, M.S., 1969; Ed.D., Ed.S., Indiana, 1977.

GEORGE E. BOCK (1957-1965) ..... Professor Emeritus of Mechanical Engineering Technology.
A.B., Columbia, 1922, M.E., 1924; (P.E., Indiana, Illinois, Washington).

MARCEL L. BOLDUC (1970) ..... Assistant Professor of Foreign Languages and Literatures.
B.A., St. Francis, 1960; M.A., Middlebury, 1966; Ph.D., Northwestern, 1975.

ELLEN M. BRATT (1978) ..... Assistant Professor of Nursing.
B.S., Indiana, 1969; M.H.S., Governor's State, 1977; (R.N., Indiana).

JEANNE K. BREW (1977) ..... Assistant Professor of Nursing.
B.S., Purdue, 1975; M.S., DePaul, 1979; (R.N., Indiana).

DENISE M. BRUMMEL (1978) ..... Programmer Analyst.
A.A.S., Purdue, 1977.

LOREN E. BRUNNER (1964-1975) ..... Professor Emeritus of Electrical Engineering Technology.
B.S., U.S. Coast Guard Academy, 1935; S.B., S.M., Massachusetts Institute, 1942.

LOUISE G. BUECHLEY (1967) ..... Assistant Professor of Nursing.
B.A., Lynchburg, 1944; M.N., Yale School of Nursing, 1947; (R.N., Indiana).

BARRIE G. BURRIDGE (1977) ..... Graduate Instructor in Engineering.
B.S.M.E., Purdue, 1973.

EDGAR H. BUYCO (1968 — West Lafayette, 1964) ..... Professor of Mechanical Engineering.
B.S., St. Tomas (Manila), 1953; Ph.D., Purdue, 1961; (P.E., Illinois, Indiana).

JANE CAMPBELL (1980) ..... Assistant Professor of English.
B.S., Arkansas, 1969; Ph.D., Northern Illinois, 1979.

ROBERT G. CAMPBELL (1980) ..... Assistant Professor of Mechanical Engineering Technology.
B.S.M.E., Purdue, 1968; M.B.A., Chicago, 1973; M.S.E., Purdue, 1977.

JOHN C. CARLISLE (1972) ..... Associate Professor of English.
B.S., Southern Illinois, 1960, M.S., 1962; M.A., Wayne State, 1969; Ph.D., Michigan, 1972.

PATRICIA A. CARLISLE (1977) ..... Assistant to the Dean for Student Development; and Professional Counselor.
B.S., Central Michigan, 1965; M.A., Michigan State, 1969.

JOSEFINA G. CARLOS (1980) ..... Assistant to the Chancellor.
B.S.B.A., St. Theresa's, 1966; M.B.A., Wayne State, 1970.

ALAN H. CARLSON (1962) ..... Assistant Dean of the School of Science and Nursing; Associate Professor of Chemistry.
B.S., North Central, 1950; M.S., Nebraska, 1952.

JEFFREY D. CASE (1975) ..... Assistant Professor of Electrical Engineering Technology.
B.S., Purdue, 1973, M.S., 1974, M.S.E., 1976.

YJEAN S. CHAMBERS (1971) ..... Associate Professor of Communication.
B.Ed., Illinois State, 1943; M.A., Purdue, 1973.

WAYNE Y.C. CHEN (1974) ..... Associate Professor of Engineering.
B.S., Chen Kung (China), 1964; M.S., Illinois, 1967; Ph.D., Cornell, 1971.

THEODORE S. CHIHARA (1971) ..... Professor of Mathematics.
B.S., Seattle, 1951; M.S., Purdue, 1953, Ph.D., 1955.

PETER P. CHOJENSKI (1969) ..... Reference Librarian; Assistant Professor of Library Science.
B.S., Gannon, 1963; M.L.S., Pittsburgh, 1968.

DONALD L. CLARK (1969) ..... Associate Professor of Mathematics.
B.S., Purdue, 1957; M.S., Illinois Institute, 1964.

W. NELSON CLARK (1974) ..... Coordinator of Tutoring Center.
B.A., Purdue, 1976.

EDWIN COHEN (1974) ..... Head, Department of Communication and Creative Arts. Professor of Communication.
A.A., El Camino Junior College, 1952; B.A., California State, 1956; M.A., 1964; Ph.D., Southern California, 1971.

RICHARD J. COMBS (1955) ..... Chancellor, A.B., A.M., South Dakota, 1951.

ARDATH A. COOLIDGE (1966) ..... Professor of Consumer and Family Sciences.
A.B., Earlham, 1941; Ph.D., Iowa State, 1945.

CATHLEEN J. COOLIDGE (1979) ..... Instructor in Management.
B.A., State University of New York — Brockport, 1975; M.A., Virginia Polytechnic, 1977.

KAREN M. COREY (1963) ..... Reader Service Librarian and Associate Professor of Library Science.
A.B., Purdue, 1963; M.L.S., Indiana, 1973.

LARRY M. CRAWFORD (1962-1965, 1968) ..... Dean for Student Development; Associate Professor of Education.
B.P.E., Purdue, 1960, M.S., 1961; Ed.D., Indiana, 1972.

PHYLLIS A. CURTIS (1965) ..... Coordinator of Continuing Education.

THOMAS E. DAILY (1979) ..... Purchasing and General Services Manager.
B.S., Indiana, 1957.

MILAN DAKICH (1970) ..... Assistant Professor of Communication.
B.S., Indiana State, 1953, M.S., 1964.

VYTENIS B. DAMUSIS (1970) ..... Associate Professor of Psychology.
B.S., Wayne State, 1964; M.A., 1970; Ph.D., 1972.

JOHN E. DAVIS (1969) ..... Professor of Education.
B.S., Oregon College of Education, 1956; M.Ed., Oregon, 1961; Ed.D., 1964.

E. GENE DE FELICE (1970) ..... Assistant Professor of Political Science.
B.A., Hofstra, 1964; M.A., Chicago, 1967, Ph.D., 1971.

GLENN E. DEGRAFF (1967) ..... Assistant Professor of Mechanical Engineering Technology.
B.S., Purdue, 1965, M.S., 1967.

DONNA J. DELPH (1970) ..... Associate Professor of Education.
B.S., Ball State, 1953, M.A., 1963, Ed.D., 1970.

MARY S. DEMITROULAS (1979) ..... Adjunct Assistant Professor of Biology.
B.S., Culver Stockton, 1964; M.T. (ASCP) Methodist Hospital School of Medical Technology, 1964.

MARTIN J. DENKHOFF (1968) ..... Bursar.
B.S., Loyola, 1960.

JAMES E. DEUEL (1972) ..... Associate Professor of Industrial Engineering Technology.
B.S.I.E., Florida, 1955, M.S.E., 1956; (P.E., Florida).

MAURICE E. DIXON (1964) ..... Associate Professor of Communication and Creative Arts.
B.S., Ball State, 1959; M.A., Purdue, 1964.

TERENCE J. DOUGHERTY (1970) ..... Associate Professor of Biology.
A.B., Villanova, 1954; M.S., Pennsylvania, 1965; Ph.D., Delaware, 1970.

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B.A., Roosevelt, 1963, M.A., 1968; Ph.D., Purdue, 1975.

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B.S., East Texas State, 1954; M.Ed., Texas, 1960, Ph.D., 1969.

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A.B., Michigan, 1931, LL.B., 1936; M.A., American, 1952; LL.M., Harvard, 1954; Ph.D., University of London (England), 1957.

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